Consumer Energy Research:

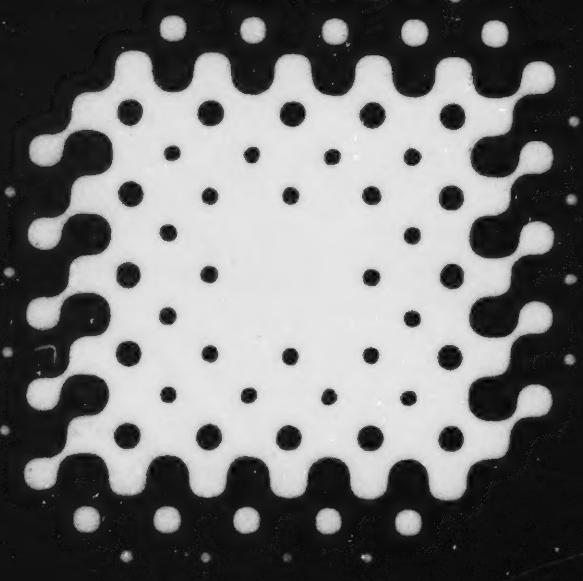
an annotated bibliography

1984

Recherche sur la consommation d'énergie:

une bibliographie annotée

C. Dennis Anderson
Gordon H.G. McDougall



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CONSUMER ENERGY RESEARCH: AN ANNOTATED BIBLIOGRAPHY
RECHERCHE SUR LA CONSOMMATION D'ÉNERGIE : UNE BIBLIOGRAPHIE ANNOTÉE
1984

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Energy Research from a Consumer Perspective: An Annotated Bibliography/Perspective du consommateur sur la recherche en matière d'énergie : une bibliographie annotée by/par Dennis Anderson and/et Carman Cullen (1979).

Energy Consumption and Conservation Patterns in Canadian Households: A Summary/Habitudes de consommation et de conservation de l'énergie dans les foyers canadiens : résumé by/par G.H.G. McDougall, J.R. Brent Ritchie and/et John D. Claxton (1980).

The Role of Home Energy Audits in Facilitating Retrofits/La vérification du rendement énergétique des habitations by/par Terry Deutscher and/et Hugh Munro (1980).

Energy: Canadians' Attitudes and Reactions/Attitudes et réactions des Canadiens face à la situation énergétique (1975-1980) by/par Gordon H.G. McDougall and/et Gerald Keller (1981).

Consumer Energy Research: An Annotated Bibliography, 1982/Recherche sur la consommation d'énergie : une bibliographie annotée, 1982 by/par C. Dennis Anderson and/et Gordon H.G. McDougall (1982).

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Early Adopters of Energy Conservation Products in Winnipeg: A Case Study/Premiers utilisateurs de produits économes d'énergie à Winnipeg : étude de cas by/par Ian Fenwick, Patricia Simmie and/et Roger Heeler (1984).

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Forthcoming/À paraître

An Interim Assessment of the Energuide Program/Évaluation provisoire du programme Énerguide by/par Peter Tryfos and/et Ian Fenwick.

Diffusion of Natural Gas in the Residential Sector in Quebec/Diffusion du gaz naturel dans le domaine résidentiel au Québec by/par Michel Zins.

Energy Cost Indicator Demonstration Program: A Report on Canadian and United States Field Experiments/Programme d'essai de la calculatrice du prix de l'énergie : rapport sur les études expérimentales au Canada et aux États-Unis by/par Pierre Filiatrault, R. Bruce Hutton and/et Gary A. Mauser.

PREFACE

This document is a companion to two previous volumes entitled *Consumer Energy Research: An Annotated Bibliography, 1982* and *Consumer Energy Research: An Annotated Bibliography, 1983*. It includes detailed annotations of over 250 research studies, most of which were written in 1982. The authors would like to acknowledge the financial support provided by Consumer and Corporate Affairs Canada and the commitment of its officials to this effort.

In preparing the annotations, the work of a number of individuals should be noted. Anne Percival (MBA), Carman Cullen (MBA) and Bill White collected the papers and toiled with skill and good humour at the tedious task of summarizing many, often lengthy, research reports. The enormous job of typing the bibliography was done by Susan Harder, Elsie Grogan, Mildred McTavish and Olga Stanley; their professionalism was of considerable assistance in the preparation of this report. Finally, the efforts of hundreds of authors and dozens of agencies are gratefully acknowledged. Their willingness to supply research studies made this annotated bibliography possible.

There are a number of other useful bibliographies and reviews for those interested in the consumer energy field. These are:

Baum, Andrew, and Jerome E. Singer, eds. 1981. *Advances in Environmental Psychology*. Vol. 3, *Energy: Psychological Perspectives*. Hillsdale, N.J.: Lawrence Erlbaum Associates.

Bemis, Virginia. 1977. *Energy Guide: A Directory of Information Sources*. New York: Garland Publishing Co.

Claxton, John D., C. Dennis Anderson, J.R. Brent Ritchie, and Gordon H.G. McDougall. 1981. *Consumers and Energy Conservation*. New York: Praeger Publishers.

Cunningham, William H., and Sally Cook Lopreato. 1977. *Consumers' Energy Attitudes and Behavior*. New York: Praeger Publishers.

Ellis, Peter, and George Gaskell. 1978. "A Review of Social Research on the Individual Energy Consumer." Working paper. Department of Social Psychology, London School of Economics and Political Science.

Energy Mines and Resources. Energy Information Index (Annual). Ottawa.

Farhar, Barbara C., Patricia Weis, Charles T. Unseld, and Barbara A. Burns. 1979. *Public Opinion About Energy: A Literature Review.* Prepared for the U.S. Department of Energy. Golden, Colorado: Solar Energy Research Institute.

Frankena, Frederick. 1977. *Energy Intensity: A Selected Annotated Bibliography*. Council of Planning Librarians Exchange Bibliography No. 1306. Monticello, Ill.: Vance Bibliographies.

Joerges, Bernward. 1981. "Consumer Energy Research: An International Bibliography." Working paper. Internationales Institut Für Umwelt and Gesellschaft, Berlin.

Katz, Reinhard. 1980. "Energy Conservation from a Consumer Perspective: A State of the Art Review." Working paper. Institut Für Marketing, Westfälische Wilhelms-Universität Münster, Federal Republic of Germany.

McDougall, Gordon H.G., John D. Claxton, J.R. Brent Ritchie, and C. Dennis Anderson. 1981. "Consumer Energy Research: A Review." *Journal of Consumer Research* 8, no. 3: 343-54.

Morrison, Denton E., et al. 1975. *Energy: A Bibliography of Social Science and Related Literature*. New York: Garland Publishing Co.

_______. 1977. *Energy II: A Bibliography of 1975-1976 Social Science and Related Literature*. New York: Garland Publishing Co.

Robinson, S.N., et al. 1976. "Review of Existing Data on Energy Use in Residential Buildings." Mimeo. Washington: National Bureau of Standards.

Stern, Paul C., and Gerald T. Gardner. 1981. "Psychological Research and Energy Policy." *American Psychologist* 36, no. 4: 329-42.

Winkler, R.C., and R.A. Winnett. 1982. "Behavioral Interventions in Resource Conservation." *American Psychologist* 37, no. 4: 421-435.

In addition to the bibliographies and reviews listed above, a wide variety of sources were employed. These additional sources are listed in Table 15 (Journals), Table 16 (Conference Proceedings), and Table 17 (Other Sources).

The authors will continue to monitor the consumer energy research field; they encourage researchers who have conducted studies in the field to share their knowledge by forwarding copies of their results to either author. In conclusion, it is hoped that this annotated bibliography will assist both practitioners and researchers in the major goal of achieving efficient consumer energy use. Improved understanding of consumer energy consumption and conservation is essential if we, as a society, wish to confront and overcome the energy problems which face us today.

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AVANT-PROPOS

Le présent document va de pair avec deux ouvrages précédents intitulés *Recherche sur la consommation d'énergie : une bibliographie annotée, 1982* et *Recherche sur la consommation d'énergie : une bibliographie annotée, 1983*. Il comporte des annotations détaillées sur plus de 250 travaux de recherche dont la plupart ont été rédigés en 1982. Les auteurs tiennent à exprimer leur reconnaissance pour l'aide financière qu'ils ont obtenue de Consommation et Corporations Canada et l'encouragement que leur ont prodigué ses responsables.

Le travail de nombreux collaborateurs mérite d'être souligné. Anne Percival (MBA), Carman Cullen (MBA) et Bill White ont amassé la documentation et se sont attelés avec compétence et bonne humeur à la tâche fastidieuse de résumer de nombreux et souvent longs rapports de recherche. Susan Harder, Elsie Grogan, Mildred McTavish et Olga Stanley se sont chargées de la masse impressionnante des travaux de dactylographie; leur professionnalisme nous a grandement facilité la tâche. Il y a lieu, enfin, de signaler les efforts de centaines d'auteurs et de douzaines d'organismes qui, en acceptant de fournir des rapports de recherche, ont rendu possible la publication du présent ouvrage.

Il existe nombre d'autres bibliographies et études utiles pour ceux qui s'intéressent à la consommation d'énergie, entre autres les suivantes :

Baum, Andrew et Jerome E. Singer, édit., *Advances in Environmental Psychology*, vol. 3, *Energy: Psychological Perspectives*. Hillsdale, N.J., Lawrence Erlbaum Associates, 1981.

Bemis, Virginia, *Energy Guide: A Directory of Information Sources*, New York, Garland Publishing Company, 1977.

Claxton, John D., C. Dennis Anderson, J.R. Brent Ritchie et Gordon H.G. McDougall, *Consumers and Energy Conservation*, New York, Praeger Publishers, 1981.

Cunningham, William H. et Sally Cook Lopreato, *Consumers' Energy Attitudes and Behavior*, New York, Praeger Publishers, 1977.

Ellis, Peter et George Gaskell, "A Review of Social Research on the Individual Energy Consumer", document de travail, Department of Social Psychology, London School of Economics and Political Science, England, 1978.

Énergie, Mines et Ressources, Index des données énergétiques (annuel), Ottawa.

Farhar, Barbara C., Patricia Weis, Charles T. Unseld et Barbara A. Burns, *Public Opinion About Energy: A Literature Review*, ouvrage préparé pour le U.S. Department of Energy, Golden, Colorado, Solar Energy Research Institute, 1979.

Frankena, Frederick, *Energy Intensity: A Selected Annotated Bibliography*, Council of Planning Librarians Exchange Bibliography No. 1306, Monticello, Ill., Vance Bibliographies, 1977.

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Katz, Reinhard, "Energy Conservation from a Consumer Perspective: A State of the Art Review", document de travail, Institut Für Marketing, Westfälische Wilhelms-Universität Münster, République fédérale d'Allemagne, 1980.

McDougall, Gordon H.G., John D. Claxton, J.R. Brent Ritchie et C. Dennis Anderson, "Consumer Energy Research: A Review", *Journal of Consumer Research*, vol. 8, n° 3, 1981, p. 343-354.

Morrison, Denton E. *et al.*, *Energy: A Bibliography of Social Science and Related Literature*, New York, Garland Publishing Company, 1975.

_______, *Energy II: A Bibliography of 1975-1976 Social Science and Related Literature*, New York, Garland Publishing Company, 1977.

Stern, Paul C. et Gerald T. Gardner, "Psychological Research and Energy Policy", *American Psychologist*, vol. 36, n° 4, 1981, p. 329-342.

Winkler, R.C. et R.A. Winnett, "Behavioral Interventions in Resource Conservation", *American Psychologist*, vol. 37, n° 4, 1982, p. 421-435.

En plus des bibliographies et des études susmentionnées, un large éventail de sources ont été utilisées. Elles figurent au tableau 15 (périodiques), au tableau 16 (actes des conférences) et au tableau 17 (autres sources).

Les auteurs continueront de se tenir constamment au fait de la recherche sur la consommation d'énergie. Ils encouragent les chercheurs qui ont effectué des travaux dans ce domaine à partager leurs connaissances et les invitent à leur faire parvenir des exemplaires de leurs ouvrages. Ils espèrent enfin que cette bibliographie viendra appuyer les praticiens aussi bien que les chercheurs dans leurs efforts en vue de réaliser l'objectif essentiel qu'est la maîtrise de la consommation d'énergie. L'approche et la solution de nos problèmes énergétiques actuels passent inévitablement par une meilleure connaissance de la perspective du consommateur face à la consommation et aux économies d'énergie.

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INTRODUCTION

This is the third bibliography prepared by the authors for Consumer and Corporate Affairs Canada. Since the beginning of this series in 1979, a number of changes have taken place in the field of consumer behaviour and energy use. First, a variety of external factors have led to an acceleration of conservation practices which in turn have slowed the demand for energy, particularly petroleum-based energy. These factors include an increase in oil (and gasoline) prices, a recessionary period for most of the developed Western nations, and a greater proportion of small car sales relative to total automobile sales. The net effect of these external events has been, for most Western nations, a decline in overall energy consumption. Consequently, in 1983, the pressure or perceived need to conserve energy has diminished.

Although the current situation appears favorable for oil consuming nations, past events suggest that the future could present problems. It is necessary for Western nations to adopt a long-term perspective regarding energy conservation. The goal of self-sufficiency or near sufficiency should be maintained and the current situation should be regarded as an opportunity to ensure that long-term conservation measures are implemented.

Second, though the proliferation of consumer energy research continues, changes have occurred in the nature of the studies. In general, there has been a shift from simplified/partial descriptions of consumer energy use to more complex/complete analytical approaches to understanding this sphere of behaviour. A number of specific developments evident in the recent consumer energy research literature are listed below.

1. Increased modelling of the total energy system. Existing models attempt to estimate the net energy savings resulting from various consumer energy conservation actions. In addition, the models permit exploration of the effects various conservation programs are likely to have on these conservation actions. Such modelling is a cornerstone in the development of effective conservation programs.

2. A more complete picture of the complexities of consumers' energy use. Recent research indicates increased attempts to understand the complex interactions underlying consumer energy use. In addition to attempts to model the linkages between energy attitudes and behaviour, studies have incorporated a variety of situational and environmental constraints or characteristics. Also, there appears to be greater use of findings from previous behavioural energy research in the design and interpretation of new research efforts. Finally, there has been a shift from reliance on methods and assumptions of economists to those of marketing and the behavioural sciences in exploring and explaining energy-related behaviour and in predicting the impact of energy policies and programs.

3. Greater appreciation of segmentation and targeting issues. There is increasing recognition that a variety of decision types and stages, actors and influences operate in consumer energy use decision situations. For example, studies incorporating measures for various stages of decision processes (problem recognition, information search, evaluation, etc.) and various family role structure influences are becoming more common. Also, there is greater emphasis on explaining segment differences (distributional effects) in conservation program impact.

4. Increased research in priority areas. For most nations, the energy problem is an "oil" problem. Thus, more research is being focused on reducing energy demand in the transportation sector.

5. Increased focus on program evaluation. While many, often expensive, conservation programs have been implemented, until recently few have been subjected to formal and comprehensive evaluation research.

In spite of these evolutionary changes in the nature of behavioural energy conservation research, a number of "gaps" still exist in this field. In particular, it appears that the following topics warrant further research attention:

1. Programs designed to reduce energy consumption in the transportation area. The energy "problem" is primarily an "oil" problem. Since personal transportation is the major use of oil, more work is needed to determine what general strategies should be pursued to accelerate conservation in this area. Within these general strategies, the specific programs that are most likely to be cost-effective in achieving meaningful energy savings must be identified.

2. Relative effects of various levels of financial incentives in encouraging conservation. Specifically, there is a need to increase the accuracy of predicted responses to economic incentives.

3. Consumer reaction to energy price changes. In particular, the short (i.e., three months) and intermediate (i.e., three months to one year) effects of small versus large energy price increases needs to be investigated.

4. Linkages between actual behaviour and self-reported measures of intentions or behaviour. These should be explored in areas such as energy use, conservation steps and program adoption. The validity of self-reports is seldom addressed, though a high proportion of studies rely solely on self-reported intentions or behaviour.

5. Sequence of conservation steps. Further research should be directed at understanding the general sequence of conservation steps homeowners take and whether or not this sequence differs by income group or other socioeconomic or demographic factors.

6. Post-decision satisfaction of consumers who have taken major conservation actions. This research should also explore possible negative consequences to consumers, their houses or their energy-using equipment resulting from having taken specific conservation actions.

In summary, while current events indicate that motivational forces for energy conservation have diminished somewhat, a long-term perspective should be adopted. Now is an opportune time to gain a better understanding of consumer behaviour and energy use and the factors which will assist adoption of an enduring conservation ethic.

The fundamental purpose of this bibliography and most research in the field is to answer the critical question: What strategies are most effective in achieving energy savings in the consumer sector while maintaining a viable economic system and equity for consumers? Though the search for answers must continue, the present bibliography provides an up-to-date picture of relevant evidence.

Objectives and Format

In preparing this annotated bibliography the authors were guided by three objectives:

1. to provide both practitioners and researchers with a comprehensive package of existing information in the consumer energy research field;

2. to provide sufficient detail in the annotations to enable the reader to appreciate the research methods and results; and

3. to provide an index classification system that minimizes the search time for a reader interested in a particular aspect of consumer energy research.

To accomplish these objectives, a concentrated effort was made to collect unpublished material as well as to review journals for relevant published articles. A wide variety of sources were contacted, including governments, utilities, research institutes and private firms. A deliberate effort was made to include agencies outside North America.

For the most part the bibliography is limited to annotations of empirical studies. However, it includes a number of descriptive and econometric reports which appeared to make a significant contribution to understanding consumers and energy use. Though over 250 annotations are presented, it must be emphasized that this bibliography is in no way offered as a complete collection of all consumer related energy research to date. The research in this area continues to expand and it proved difficult and time consuming to access all the sources that might provide relevant information.

The format of the annotations is as follows: at the top of the page is displayed the author, date of publication, title and source of the study. Annotations of descriptive reports and some of those obtained from other agencies are presented under the sole title Abstract. Annotations of empirical studies are divided into four sections: objectives, method, variables and findings/implications. The implications noted are those mentioned by the authors of the reports, and deal, for the most part, with public policy decisions and further research efforts.

Care was taken to provide a reasonable amount of detail in the annotations to enable the reader to understand the methodology, the results, and the degree to which the implications of the study can be generalized to other situations. It is hoped that sufficient detail is provided so that it is only necessary for the reader to obtain the original source for those studies which are of paramount interest.

Studies are presented in alphabetical order, according to author. Each study has been assigned a four-digit code number with each letter of the alphabet (except for the last three) covering 400 numbers.

The content of the studies reviewed is classified in a series of tables presented in this introduction to the abstracts. The tables are intended to provide a summary of sources, types, and foci of the various studies. More importantly, they are intended to aid researchers interested in specific topics to easily locate those studies most relevant to their work. The studies are categorized using a number of different classification criteria: for example, methodology used, type of energy form, type of policy initiative, and type of consumer activity. Details on the classification system are provided in the section, "How to Use the Bibliography." First, a general overview of the studies is presented.

INTRODUCTION

Voici la troisième bibliographie que nous préparons pour le compte de Consommation et Corporations Canada dans le cadre d'une série d'études sur la situation énergétique. Depuis l'inauguration de cette série en 1979, nombreux ont été les changements à survenir dans le domaine de la maîtrise de l'énergie et du comportement des consommateurs à cet égard. En premier lieu, divers facteurs extérieurs ont amené l'intensification des pratiques d'économie énergétique et, partant, un ralentissement de la demande d'énergie, particulièrement de l'énergie tirée du pétrole. Ces facteurs comprenaient la hausse du prix du pétrole (et de l'essence), la récession frappant la plupart des pays occidentaux développés et l'accroissement de la part des petites voitures dans le total des ventes d'automobiles. L'addition de ces facteurs externes a eu pour résultat net d'entraîner une baisse de la consommation énergétique globale dans la majorité des pays occidentaux. À telle enseigne que, en 1983, l'urgence - ou la nécessité perçue - de ménager l'énergie s'est quelque peu estompée.

Bien que la situation actuelle apparaisse favorable aux pays consommateurs de pétrole, les aléas du passé devraient suffire à nous mettre en garde contre les incertitudes de l'avenir. Il est impératif que les pays d'Occident s'arment d'une perspective à long terme face au problème de la maîtrise de l'énergie. Il faut par ailleurs maintenir l'objectif de l'autosuffisance - ou de la quasi-suffisance - et profiter du répit actuel pour assurer l'introduction de mesures d'économie à longue échéance.

En second lieu, s'il y a toujours profusion de recherches sur la consommation d'énergie, on a assisté à une réorientation des études. De manière générale, on est passé d'une description partielle et simplifiée de l'utilisation de l'énergie par les consommateurs à une approche analytique plus complexe et plus complète permettant de comprendre cette sphère du comportement des individus. Voici un aperçu de certains développements précis qui se dégagent de la littérature traitant de la consommation d'énergie.

1. Modélisation accrue de l'ensemble du bilan énergétique. Les modèles actuels visent à estimer le gain net résultant de diverses mesures d'économie de l'énergie. En outre, les modèles permettent d'analyser l'incidence que divers programmes de maîtrise de l'énergie sont susceptibles d'avoir sur ces mesures d'économie. La modélisation apparaît comme la pierre angulaire de la mise en place de programmes efficaces de maîtrise énergétique.

2. Tableau plus complet de la complexité de la dépense énergétique des consommateurs. De récents travaux indiquent qu'on essaye de plus en plus de saisir les phénomènes complexes sous-tendant la consommation d'énergie. En plus de chercher à modéliser les liens entre les attitudes et les comportements face à la consommation d'énergie, les études ont incorporé diverses contraintes ou caractéristiques situationnelles ou environnementales. On semble par ailleurs faire une utilisation plus poussée des résultats de recherches antérieures sur le comportement à l'égard de l'énergie, lors de la préparation et de l'interprétation de nouvelles études. Enfin, on a assisté à un déplacement d'accent : délaissant quelque peu les méthodes et les hypothèses de la science économique, on en est venu à faire appel au marketing et aux sciences du comportement afin d'explorer et d'expliquer les comportements vis-à-vis de l'énergie et de prévoir l'incidence d'une politique et de programmes de maîtrise énergétique.

3. Sensibilisation accrue aux questions de segmentation et de choix des publics cibles. On reconnaît de plus en plus que tout un ensemble de types et de phases de décision, d'agents et d'influence interviennent lorsqu'il s'agit d'arrêter un choix en matière d'énergie. Par exemple, les études qui incorporent diverses étapes du processus de décision (reconnaissance du problème, quête de l'information, évaluation, etc.) et qui tiennent compte de l'influence de divers types de rôles familiaux, deviennent plus fréquentes. On s'attache aussi davantage à expliquer les différences entre les segments de population (effets de la distribution) dans la manière dont les programmes de maîtrise de l'énergie sont reçus.

4. Recherche plus poussée dans les secteurs prioritaires. Pour la plupart des pays, le problème de l'énergie est un problème "pétrolier". C'est pourquoi la recherche s'oriente davantage vers la réduction de la demande dans le secteur des transports.

5. Concentration accrue sur l'évaluation des programmes. On aura eu beau mettre sur pied des programmes nombreux — et souvent coûteux — de maîtrise de l'énergie, jusqu'à tout récemment bien peu avaient fait l'objet d'évaluations poussées et dans les règles.

Malgré cette transformation progressive de la recherche sur les comportements face à la consommation d'énergie, il existe encore quelques lacunes en ce domaine. Les points suivants mériteraient notamment une étude plus approfondie :

1. Programmes visant à réduire la consommation d'énergie dans le secteur des transports. Le "problème" de l'énergie est avant tout le problème du "pétrole". Comme le transport individuel accapare encore la plus grosse part du pétrole consommé, un travail considérable reste à faire pour déterminer une stratégie globale propre à accélérer les économies en ce domaine. Puis, à

l'intérieur de cette stratégie, il faut concevoir les programmes qui, tout en étant les plus efficaces, peuvent être réalisés au moindre coût.

2. Effets relatifs des diverses formes d'encouragement financier à l'économie d'énergie. Plus précisément, il est nécessaire de mieux prévoir la réponse des gens aux différents stimulants financiers qu'on leur propose.

3. Réaction des consommateurs face aux variations du prix de l'énergie. Il y aurait lieu notamment d'étudier les répercussions à court terme (p. ex., trois mois) et à moyen terme (p. ex., de trois mois à un an) de faibles hausses en regard de fortes hausses du prix de l'énergie.

4. Correspondance entre la mesure du comportement réel et celle des intentions ou des comportements signalés par les consommateurs eux-mêmes. Il y aurait lieu de vérifier cette correspondance dans les domaines tels que l'utilisation de l'énergie, les pratiques d'économie et l'adhésion à différents programmes. On se préoccupe rarement de la validité des auto-évaluations des consommateurs, et ce même si une forte proportion des études reposent uniquement sur les intentions ou les comportements signalés par les intéressés.

5. Séquence des mesures d'économie. Il conviendrait de chercher à mieux comprendre la séquence générale des mesures d'économie prises par les consommateurs et de voir si cette séquence varie ou non suivant le niveau de revenu ou d'autres facteurs socio-économiques et démographiques.

6. Degré de satisfaction des consommateurs ayant adopté des pratiques ou pris des mesures importantes d'économie d'énergie. La recherche devrait également porter sur les éventuelles conséquences négatives d'actions spécifiques d'économie d'énergie pour les consommateurs, leur habitation ou leur appareillage utilisant une forme quelconque d'énergie.

En résumé, alors que la situation actuelle laisse voir que la motivation à ménager l'énergie a diminué quelque peu, il conviendrait d'adopter une perspective à long terme. Le moment est opportun pour chercher à mieux comprendre le comportement des consommateurs et leur utilisation de l'énergie ainsi que les facteurs qui contribueront à l'adoption d'une éthique durable à ce chapitre.

Le but premier de la présente bibliographie et de la plupart des travaux de recherche dans le domaine abordé ici est de répondre à la question fondamentale : quelles stratégies sauront le mieux faire réaliser des économies au chapitre de la consommation individuelle d'énergie, sans porter atteinte au système économique ni à l'équité à l'égard des consommateurs? Même si notre quête de solutions doit demeurer incessante, il faut se réjouir que cette bibliographie fournisse déjà quelques éléments de réponse.

Objectifs et présentation

Dans la préparation de cette bibliographie annotée, les auteurs ont poursuivi trois objectifs :

1. fournir aux praticiens et aux chercheurs une documentation étendue dans le domaine de la recherche sur la consommation d'énergie;

2. offrir suffisamment de renseignements pour permettre au lecteur d'évaluer la recherche et ses résultats; et

3. fournir un type de répertoire qui facilite le travail du lecteur intéressé à un aspect particulier de la recherche sur la consommation d'énergie.

Compte tenu de ces objectifs, un grand effort a été fait pour réunir les travaux de recherche non publiés et pour dépouiller les périodiques en vue de répertorier les articles pertinents. On a également consulté de nombreuses autres sources, entre autres les administrations gouvernementales, les services publics, les instituts de recherche et les entreprises du secteur privé. Un effort délibéré a été fait pour inclure des organismes de l'extérieur de l'Amérique du Nord.

Pour une large part, la bibliographie se limite à des annotations d'études empiriques. Toutefois, elle inclut un certain nombre de rapports descriptifs et économétriques qui semblent offrir un apport important à la connaissance des consommateurs et de l'utilisation de l'énergie. Mais, si la bibliographie présente plus de 250 annotations, il faut signaler qu'elle ne constitue pas un répertoire complet de tous les travaux de recherche effectués à ce jour concernant la consommation énergétique. La recherche dans ce domaine prend en effet de plus en plus d'ampleur et il s'avère difficile et laborieux de rassembler toutes les sources qui pourraient offrir l'information pertinente.

Selon le mode d'annotation adopté, le nom de l'auteur, la date de publication, le titre et la source de l'étude figurent en haut de la page. Les annotations des rapports descriptifs sont présentées globalement sous le titre "Abrégé". Les annotations des études empiriques se divisent en quatre parties : objectifs, méthode, variables et constatations/répercussions. Les répercussions signalées sont celles que mentionnent les auteurs des rapports et elles se rattachent, pour la plupart, aux politiques gouvernementales et à des travaux de recherche complémentaires.

Nous avons pris soin de donner suffisamment de renseignements dans les annotations pour permettre aux lecteurs de comprendre les méthodes utilisées, les résultats obtenus et la mesure dans laquelle les répercussions de l'étude peuvent s'appliquer à d'autres situations. Nous espérons avoir fourni assez de précisions pour qu'il ne faille se référer à la source originale que dans le cas d'une étude de première importance.

Les études sont présentées par ordre alphabétique d'auteur. Elles portent toutes un code numérique de quatre chiffres et chaque lettre de l'alphabet, à l'exception des trois dernières, correspond à 400 numéros.

Le contenu des études analysées est classé dans la série de tableaux publiés plus loin dans l'introduction. Ces tableaux ont pour objet de fournir un résumé des sources, des types d'études et de leur thème. Ils visent surtout à aider les chercheurs qui s'intéressent à des sujets précis à trouver facilement les études qui leur seront les plus utiles. Les études sont classées selon divers critères, par exemple la méthode utilisée, la forme d'énergie, le type de politique et le genre d'activités de consommation. Des précisions sur le mode de classification sont données dans la section intitulée "Comment utiliser la bibliographie". Mais d'abord, voici une vue d'ensemble des études présentées.

OVERVIEW OF STUDIES

Origin

Table 1 presents the studies, classified by origin, first by country and then by source. The vast majority of the studies are North American in origin (84%), but the proportion of non-North American reports is growing (16%). This is reflected in part by the inclusion of studies presented at the International Conference on Consumer Behavior and Energy Policy held in the Netherlands in September 1982. It should be noted that considerable research has been conducted in many European countries but, because of language and other barriers, few of the studies are reported here.

Distribution by source shows the diversity of the reports presented in the bibliography. Studies originate with governments, utilities, individuals, research institutes, private consulting firms, and special interest groups. Some studies have a somewhat mixed origin, such as those commissioned by governments and utilities and prepared by private firms. As with previous volumes, the number of studies in this volume which originate with utilities (7%) underrepresents their activity. Considerable efforts are being made by utilities but many of the studies are not routinely reported externally or are considered proprietary information.

Methodologies

The bibliography consists mainly of empirical studies, including surveys and experiments (Table 2). In general, there has been a decline in general surveys and an increase in specific studies evaluating conservation programs and addressing conceptual issues in the area. These descriptive studies reflect the maturing of the field as many of them provide excellent summaries of research in specific areas and others discuss conservation programs in the field and point out directions for future research efforts. A number of studies contain elements of both empirical and descriptive efforts.

Attitudes and Behaviour

Table 3 provides a summary of the attitudes and behaviour examined by the various studies. One problem with behavioural research in the consumer energy field is that it is often quite difficult to monitor actual behaviour. For example, details of actual driving habits, purchase decisions, or home-related energy behaviour are difficult and expensive to obtain. Instead, studies frequently rely upon either self-reported behaviour measures or reported behaviour intentions. The majority of the behavioural studies use surrogate measures for actual energy consumption. Some of the problems with this approach become apparent when reviewing the research based on actual behaviour patterns. Specifically, the lack of relationship between actual consumption and self-reported behaviour may lead one to question some of the surrogate measures employed in consumer energy research. It suggests that studies which collect actual energy consumption data may offer more valid conclusions than studies which use either self-reported behaviour or intentions.

A number of studies probe consumers' attitudes towards various aspects of the energy situation. The apparent hypothesis is that there is some relationship between energy-related attitudes and energy-related behaviour. It is interesting to note that the conclusions and findings of the various attitude studies do tend to substantiate each other. However, as mentioned above, there is a serious issue as to whether attitude and self-reported energy-related behaviour exhibit a strong degree of association with actual energy consumption.

As indicated in Table 3, the attitude studies are grouped into nine categories. The first three (belief, seriousness and blame) are self-explanatory. Studies examining the attitudes concerning the individual's role in conservation generally try to discover whether consumers feel that they have a role to play in energy conservation, or that their individual efforts will have no effect on the nation's energy consumption.

Attitudes toward new technology include not only reactions to nuclear power, but also people's belief in science's ability to solve the crisis and their opinions about the feasibility of solar and other energy sources. Attitudes concerning the environment and quality of life delve into consumers' reactions to trade-offs between pollution, developing energy sources, and the perceived effects on quality of life of living with less energy. Attitudes concerning various conservation strategies examine people's feelings towards possible or actual conservation measures (e.g., financial incentives for insulation). Most of the studies in this category collect information on a variety of attitudes.

Activity Area

In Table 4 the studies are classified by the major activity areas upon which they focus — home-related, transportation-related or lifestyle-related. Some studies cover more than one area, and some monitor behaviour in virtually all activity areas. A large number examine space heating/cooling and appliance use in the home.

As might be expected by the dominance of North American studies, the bulk of the transportation-related studies are concerned with the private automobile. Those which involve public transportation deal mainly with attitudes toward alternative modes and attempt to discover why consumers do not utilize public transit to a greater extent.

The lifestyle-related studies examine various aspects of the energy situation and how these may affect leisure time activities, including travel and in-home activities. The general energy conservation studies are frequently concerned with identifying people's attitudes and activities toward conservation at a somewhat abstract level. For example, some of the studies examine the "conserver ethic" of various segments of the population.

Energy Form

Table 5 classifies the studies by energy form and, as with other tables, some studies are included in more than one category. Several studies did not deal with a specific energy form.

The distribution of the studies by energy form does reflect, somewhat, their relative usage in North America. The dominance of electricity studies, however, likely reflects the ease with which residential electric consumption data can be obtained. Solar-related studies involve the description of government and utility programs to develop and market solar power and/or consumers' perceptions of solar power and its potential for use in the future.

Consumer Decision-making Stage

In Table 6 studies are classified by the stage in the consumer decision-making process upon which they focus. The majority focus on the post-choice or use stage. The few that focus on the pre-choice stage include those concerned with the choice of large versus small automobiles and with appliance choices.

Product/Service Target

Table 7 classifies the studies by the type of product/service target. In general, these studies report on consumer attitudes or reactions toward measures designed to improve the energy efficiency of the home and/or measures designed to encourage reduced automobile use. The majority of studies focus on retrofits (either insulation or furnace), appliances and automobiles. An increasing number of studies explore consumer attitudes and reactions towards various conservation strategies as well as methods of gaining consumer acceptance of them.

Type of Energy Policy

Table 8 classifies studies by the type(s) of energy policy examined, mentioned or recommended, or for which attitudes are assessed. Policies are classified on two dimensions: financial vs nonfinancial, and regulatory vs. persuasive.

Financial-persuasive policies include incentives such as tax credits (for retrofitting or buying a smaller car) and rebates (as incentives to consume less energy). Financial-regulatory policies include disincentives such as price manipulations (e.g., through taxation) by government.

Nonfinancial-persuasive policies are largely informational programs. Nonfinancial-regulatory policies are restrictive and include those involving legislating new standards for buildings, appliances and automobiles, as well as energy labelling and rationing. Again, it should be mentioned that the classification categories used are not mutually exclusive. Most studies mention or discuss more than one of the policy types.

VUE D'ENSEMBLE DES ÉTUDES

Origine

Le tableau 1 présente les études classées selon leur origine : d'abord le pays et ensuite la source. La grande majorité est d'origine américaine (84 %) mais la proportion de rapports qui ne sont pas nord-américains s'est sensiblement accrue (16 %). Cela est dû en partie à l'inclusion de travaux présentés à la Conférence internationale sur les comportements des consommmateurs et les politiques énergétiques qui a eu lieu aux Pays-Bas en septembre 1982. D'importantes recherches sont menées, particulièrement en Europe, mais en raison de barrières linguistiques et autres, très peu de ces études sont signalées ici.

Le classement par source montre la diversité des rapports présentés dans la bibliographie. Les études sont l'oeuvre d'administrations gouvernementales, de services publics, de particuliers, d'instituts de recherche, de bureaux d'experts-conseils et de diverses associations. Certaines études sont en quelque sorte d'origine mixte, par exemple, celles qui ont été commandées par des gouvernements et des services publics et réalisées par l'entreprise privée. Encore une fois, des études répertoriées ici, le nombre de celles qui proviennent de services publics (7 %) ne colle pas à la réalité, puisque dans les faits il y en a davantage. En effet, les services publics ont mené un grand nombre d'études, mais beaucoup d'entre elles ne sont pas publiées et sont considérées comme des documents internes.

Méthodes

La bibliographie se compose en majeure partie d'études empiriques, comportant notamment des enquêtes et des expériences (tableau 2). En gros, on constate une baisse du nombre d'enquêtes générales et une augmentation des études particulières visant à évaluer les programmes de maîtrise de l'énergie et abordant des questions théoriques à ce sujet. Ces études descriptives marquent une certaine évolution en ce que nombre d'entre elles fournissent d'excellents résumés de recherche dans des domaines précis tandis que d'autres abordent sérieusement les programmes d'économies d'énergie et proposent des orientations pour les recherches futures. Un certain nombre d'études contiennent à la fois des éléments empiriques et descriptifs.

Attitudes et comportements

Le tableau 3 présente un résumé des attitudes et des comportements analysés dans les diverses études. Le fait que les comportements réels en matière de consommation d'énergie sont difficilement observables pose un problème aux chercheurs. Par exemple, il serait difficile et coûteux d'obtenir des renseignements sur les habitudes au volant, les décisions d'achat des consommateurs ou les comportements domestiques en matière de consommation d'énergie. Il s'ensuit que les études doivent se fonder la plupart du temps sur les interprétations que les personnes interrogées donnent de leur comportement ou de leurs intentions. La majeure partie des études sur le comportement utilise des mesures de substitution, faute de données sur la consommation réelle d'énergie. Certains problèmes découlant de cette approche sont mis en lumière lorsqu'on analyse la recherche fondée sur les comportements réels. Plus précisément, l'écart entre la consommation réelle et le comportement signalé par la personne peut nous inciter à mettre en doute la validité de certaines mesures de substitution employées dans la recherche sur la consommation d'énergie. Ce fait nous porte à croire que les études qui comportent des données recueillies sur la consommation réelle d'énergie offrent des conclusions plus valables que les études fondées sur les déclarations des personnes concernant leur comportement et leurs intentions.

Bon nombre d'études constituent une analyse des attitudes du consommateur face à certains aspects de la situation énergétique. L'hypothèse apparente est qu'il existe un certain rapport entre les attitudes et le comportement en matière de consommation d'énergie. Il est intéressant de noter que les remarques et les conclusions sur les attitudes tendent à se confirmer d'une étude à l'autre. Cependant, comme nous l'avons dit précédemment, il importe de déterminer si les attitudes et les comportements signalés par les personnes interrogées correspondent étroitement à la consommation réelle d'énergie.

Comme l'indique le tableau 3, les études relatives aux attitudes sont groupées en neuf catégories. Les trois premières — prise de conscience de la crise énergétique, gravité de la crise, causes et responsabilités — s'expliquent d'elles-mêmes. Les études concernant les attitudes face au rôle des consommateurs en matière d'économie d'énergie en général visent à déterminer si ces derniers considèrent qu'ils ont un rôle à jouer à ce niveau, ou si au contraire ils estiment que leurs efforts individuels n'ont aucune incidence sur la consommation d'énergie au plan national.

Les attitudes à l'égard de la technologie nouvelle ne portent pas uniquement sur les réactions face à l'énergie nucléaire; elles concernant aussi la conviction que la science permettra de résoudre la crise, de même que les opinions quant à la possibilité d'utiliser l'énergie solaire ou d'autres formes d'énergie. Les études sur les attitudes face à l'environnement et à la qualité de vie traitent des réactions des consommmateurs devant la recherche d'un équilibre entre la pollution, le développement de nouvelles sources d'énergie et les effets connus d'une consommation d'énergie réduite sur la qualité de vie. L'examen des attitudes envers diverses stratégies de maîtrise de l'énergie nous permet de dégager le sentiment des gens face à diverses mesures actuelles ou éventuelles d'économie énergétique (les primes à l'isolation par exemple). La plupart des études de cette catégorie comportent des renseignements sur une foule d'attitudes.

Secteurs d'activité

Au tableau 4, les études sont classées selon les grands secteurs d'activité : la maison, les transports et le mode de vie. Certaines études portent sur plus d'un domaine et d'autres constituent une analyse des comportements dans presque tous les domaines du secteur d'activité. Un grand nombre traite du chauffage, de la climatisation, de l'eau chaude et des appareils ménagers utilisés à la maison.

Comme on pouvait s'y attendre, étant donné la prédominance des analyses provenant d'Amérique du Nord, la majeure partie des études sur le transport concernent les voitures personnelles. Les études sur les transports publics s'intéressent surtout aux attitudes face aux solutions de remplacement et visent à découvrir pourquoi les consommateurs n'utilisent pas davantage les transports en commun.

Les études relatives aux modes de vie traitent des divers aspects de la situation énergétique et de leur incidence sur les loisirs, y compris les voyages et les activités au foyer. Les études générales sur la maîtrise de l'énergie s'occupent fréquemment de caractériser à un niveau quelque peu abstrait les attitudes et les activités des gens vis-à-vis les économies d'énergie. Par exemple, certaines études envisagent l'"éthique de conservation" de divers segments de la population.

Formes d'énergie

Le tableau 5 classe les études selon la forme d'énergie et comme c'est le cas dans les autres tableaux, certaines portent sur plus d'une forme d'énergie, alors que d'autres traitent de l'énergie en général.

La répartition des études selon la forme d'énergie correspond assez bien à l'usage relatif de chaque forme en Amérique du Nord. Le nombre élevé d'études concernant l'électricité traduit probablement la facilité avec laquelle on peut obtenir des données sur la consommation d'électricité à domicile. Les études sur l'énergie solaire décrivent les programmes tant de l'État que des services publics pour exploiter et répandre cette forme d'énergie; elles portent aussi sur l'opinion des consommateurs concernant l'énergie solaire et ses possibilités d'utilisation dans le futur.

Étapes du processus de décision du consommateur

Au tableau 6, les études sont classées selon les étapes du processus de décision. La plupart porte sur l'étape qui suit le choix ou l'utilisation. Les quelques rares études qui touchent l'étape du choix en lui-même sont celles qui traitent du choix entre une grosse ou une petite voiture et entre divers appareils ménagers.

Produits et services visés

Le tableau 7 présente les études par type de produits et de services visés. En général, ces études portent sur les attitudes ou les réactions des consommateurs à l'égard des mesures destinées à améliorer le rendement énergétique à la maison et pour encourager les gens à moins utiliser leur voiture. La majorité des études traitent des transformations dans la maison (isolation ou chauffage central), des appareils ménagers et des automobiles. Un nombre croissant d'études examinent les attitudes et les réactions des consommateurs face à diverses stratégies de maîtrise de l'énergie et abordent les façons de se ménager leur appui dans ce domaine.

Types de politique énergétique

Le tableau 8 regroupe les études suivant le type de politique énergétique mentionné, analysé ou recommandé, ou encore suivant les politiques à l'égard desquelles les attitudes des consommateurs ont été examinées. Les politiques sont classées en deux catégories : selon qu'elles comportent des mesures financières ou non financières et dans chacun des cas, selon qu'elles se fondent sur la persuasion ou la réglementation.

Les politiques axées sur les mesures financières et la persuation comprennent les stimulants comme les crédits d'impôt (p. ex., pour la transformation des habitations ou l'achat d'une voiture plus petite) et les remises visant à inciter les gens à réduire leur consommation d'énergie. Les politiques axées sur la réglementation et les mesures financières concernent par exemple des changements de prix à la suite d'une taxe fixée par le gouvernement.

Les politiques fondées sur la persuasion et qui ne comportent pas de mesures financières sont souvent des programmes d'information. Les politiques qui sont orientées uniquement sur la réglementation et qui ne comprennent pas de mesures financières, sont restrictives et incluent l'adoption de nouvelles normes pour le bâtiment, les appareils ménagers, les automobiles, de même que l'étiquetage relatif à la consommation d'énergie et le rationnement.

Il convient aussi de signaler que les catégories utilisées ne s'excluent pas mutuellement. La plupart des études traitent ou examinent plus d'un type de politique.

HOW TO USE THE BIBLIOGRAPHY

The studies in the bibliography are listed alphabetically, by author, and each is assigned a four-digit code number. Except for X, Y, and Z, each letter of the alphabet is assigned 400 numbers. This is done to facilitate future updates.

The main use of code numbers is to help the reader identify studies in an area of interest. Tables 9 through 14 contain tabulations of study code numbers by major classifications of research on consumer energy use. Specifically, these tables are:

Table 9 - Classification of Studies by Methodologies Used

Table 10 - Classification of Studies by Attitude/Behaviour Measures Employed

Table 11 - Classification of Studies by Activity Area

Table 12 - Classification of Studies by Energy Form

Table 13 - Classification of Studies by Product/Service Target

Table 14 - Classification of Studies by Type of Energy Policy

A simple example will illustrate the use of these tables. Suppose a reader is interested in the effect of nonfinancial-persuasive policies (e.g., advertising programs encouraging consumers to conserve energy). The reader would use Table 14 and select any or all of the code numbers of the studies listed in that section (general information, government information, etc.). The code numbers would then be used to locate the relevant annotation in the bibliography.

COMMENT UTILISER LA BIBLIOGRAPHIE

Les études répertoriées dans la bibliographie sont énumérées par ordre alphabétique d'auteur et chacune porte un code numérique de quatre chiffres. À part les lettre X, Y et Z, chaque lettre de l'alphabet correspond à 400 numéros. Cette façon de faire vise à faciliter les prochaines mises à jour.

L'utilité principale des codes numériques est d'aider le lecteur à trouver des études dans son domaine d'intérêt. Aux tableaux 9 à 14 les études sont classées par codes numériques selon les principales catégories de recherche sur la consommation d'énergie. Ces tableaux sont les suivants :

Tableau 9 - Classification des études selon la méthode utilisée

Tableau 10 - Classification des études selon les mesures employées relativement aux attitudes et aux comportements

Tableau 11 - Classification des études selon les secteurs d'activité

Tableau 12 - Classification des études selon la forme d'énergie

Tableau 13 - Classification des études selon les produits ou les services visés

Tableau 14 - Classification des études selon le type de politique énergétique

Un exemple simple permet d'illustrer l'utilisation de ces tableaux. Supposons qu'un lecteur soit intéressé aux effets des politiques axées sur la persuasion et ne comportant pas de mesures financières (p. ex., les programmes publicitaires encourageant les consommateurs à économiser l'énergie). Il se rend au tableau 14, repère la catégorie SANS MESURES FINANCIÈRES - PERSUASION et choisit un ou plusieurs codes numériques d'études qui y figurent (sous les divers titres : information générale, information gouvernementale, etc.). Les codes numériques serviront alors à trouver l'annotation pertinente dans la bibliographie.

Table 1

Origin of Energy Studies

Origin	Number	Percentage
Country:[a]		
United States	187	72
Canada	29	11
Germany	10	4
Netherlands	10	4
United Kingdom	8	3
Other	14	6
	258	100
Source:[b]		
Individual	136	53
Research institute/centre	49	19
Government department	46	18
Private organization	5	2
Utilities	19	7
Special interest groups	2	1
	257	100

[a] Total number of studies was 252. Six studies had authors from different countries.

[b] Five studies had authors from different sources.

Tableau 1

Origine des études sur l'énergie

Origine	Nombre	Pourcentage
Pays :[a]		
États-Unis	187	72
Canada	29	11
Allemagne	10	4
Pays-Bas	10	4
Royaume-Uni	8	3
Autres	14	6
	258	100
Source :[b]		
Particuliers	136	53
Centres ou instituts de recherche	49	19
Ministères gouvernementaux	46	18
Organismes privés	5	2
Services publics	19	7
Associations	2	1
	257	100

[a] Le nombre total des études s'élève à 252. Six d'entre elles étaient d'auteurs de pays différents.

[b] Cinq études étaient d'auteurs provenant de secteurs différents.

Table 2

Methodologies Used in Energy Studies[a]

Methodology	Number
Survey (primary data):	89
Descriptive:	
Program evaluation	43
Conceptualization	39
Other	36
Diffusion:	4
Experimentation:	
Before and after	16
After only	5
Econometric:	8
Other:	12
Case History:	6

[a] Some studies are included in more than one category.

Tableau 2

Méthodes utilisées dans les études sur l'énergie[a]

Méthodes	Nombre
Enquête (données primaires)	89
Histoire de cas	6
Étude descriptive :	
Évaluation de programme	43
Conceptualisation	39
Autres	36
Diffusion:	4
Expérience :	
Avant et après	16
Après seulement	5
Économétrie :	8
Autres :	12

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[a] Certaines études sont incluses dans plus d'une catégorie.

Table 3

Energy Consumption and Conservation Attitudes/Behaviour Studied[a]

Type of Measure	Number
Behaviour:	
Actual behaviour patterns	67
Self-reported behaviour	85
Behaviour intentions	17
Attitudes (all categories):	65
Details on Attitudes Towards:	
Belief/knowledge of crisis	18
Seriousness of crisis	17
Causes/blame for crisis	7
Individual's role in conservation	14
Government role (general)	7
Government role (specific policy)	11
New technology	12
Environment/quality of life	7
Lifestyle	8
Various conservation strategies	18

[a] Some studies are included in more than one category.

Tableau 3

Analyse des attitudes et des comportements face à la consommation et aux économies d'énergie[a]

Aspects analysés	Nombre
Comportements :	
Comportements réels	67
Comportements signalés par les consommateurs	85
Intentions de comportement	17
Attitudes (toutes les catégories)	65
Détails sur les attitudes face aux aspects suivants :	
Prise de conscience de la crise et connaissance de la situation	18
Gravité de la crise	17
Causes et responsables de la crise	7
Rôle du consommateur en matière d'économie d'énergie	14
Rôle du gouvernement (en général)	7
Rôle du gouvernement (politiques particulières)	11
Technologie nouvelle	12
Environnement et qualité de vie	7
Mode de vie	8
Stratégies diverses de maîtrise de l'énergie	18

[a] Certaines études sont incluses dans plus d'une catégorie.

Table 4

Activity Area of Energy Studies[a]

Activity Area	Number
Home Related:	
General home	115
Space heating	37
Space cooling	13
Water heating	8
Appliances	17
Other	3
Transportation Related:	
Private automobile	44
Van-/carpools	15
Public transportation	16
Vacation/leisure travel	11
Other	10
Lifestyle Related:	19
Other:	
General energy conservation	27
Non-residential with behavioural implications	4

[a] Some studies are included in more than one category.

Tableau 4

Études par secteurs d'activité[a]

Secteurs d'activité	Nombre
Maison :	
Habitation en général	115
Chauffage	37
Climatisation	13
Eau chaude	8
Appareils ménagers	17
Autres	3
Transport :	
Voiture personnelle	44
Covoiturage (auto ou camionnette)	15
Transport en commun	16
Déplacement (loisirs et vacances)	11
Autres	10
Mode de vie :	19
Autres :	
Maîtrise de l'énergie en général	27
Secteur non résidentiel avec aspects touchant le comportement	4

[a] Certaines études sont incluses dans plus d'une catégorie.

Table 5

Energy Form of Energy Studies[a]

Energy Form	Number
Electricity	76
Gasoline	49
Natural gas	24
Fuel oil	22
Solar	14
Wood	5
Nuclear	3
Coal	3
Other	2
Other — general	108

[a] Some studies are included in more than one category.

Tableau 5

Études relatives aux diverses formes d'énergie[a]

Formes d'énergie	Nombre
Électricité	76
Essence	49
Gaz naturel	24
Mazout	22
Énergie solaire	14
Bois	5
Énergie nucléaire	3
Charbon	3
Autres	2
Autres — études générales	108

[a] Certaines études sont incluses dans plus d'une catégorie.

Table 6

Consumer Decision-making Stage of Energy Studies[a]

Stage of Consumer Decision-making Process	Number
Prechoice	4
Choice	44
Postchoice (use)	110

[a] Some studies are included in more than one category.

Tableau 6

Études des étapes du processus de décision du consommateur[a]

Étapes de la décision	Nombre
Avant le choix	4
Au moment du choix	44
Après le choix (utilisation)	110

[a] Certaines études sont incluses dans plus d'une catégorie.

Table 7

Product/Service Target of Energy Studies[a]

Product/Service Target	Number
Retrofit (insulation)	32
Retrofit (furnace)	11
Appliances	19
Automobiles	22
Conservation devices	13
Home audits	12
Commercial audits	2
New technology	7
Acceptance/awareness of various conservation strategies	34
Miscellaneous	5

[a] Some studies are included in more than one category.

Tableau 7

Produits et services visés[a]

Produits et services visés	Nombre
Transformation (isolation)	32
Transformation (chauffage central)	11
Appareils ménagers	19
Automobiles	22
Dispositifs économiseurs d'énergie	13
Vérification des maisons	12
Vérification des établissements commerciaux	2
Technologie nouvelle	7
Acceptation/connaissance des diverses stratégies de maîtrise de l'énergie	34
Divers	5

[a] Certaines études sont incluses dans plus d'une catégorie.

Table 8

Type of Energy Policy Studied[a]

Policy Type		Number
Financial:		
Persuasive	- general information	12
	- voluntary efforts	3
	- tax credits	17
	- rebates	12
	- billing plans	13
Regulatory	- general policy	11
	- time-of-day pricing	7
	- price changes	25
Nonfinancial:		
Persuasive	- general information	27
	- voluntary efforts	9
	- government information/education programs	13
	- utility information/education programs	1
	- other information/education programs	4
Regulatory	- general policy	12
	- rationing	16
	- standards	15
	- energy labelling	7

[a] Some studies are included in more than one category.

Tableau 8

Types de politique énergétique étudiés[a]

Type de politiques		Nombre
Mesures financières :		
Persuasion	- information générale	12
	- efforts volontaires	3
	- crédits d'impôt	17
	- remises	12
	- plan de facturation	13
Réglementation	- politique générale	11
	- fixation des prix selon le moment de la journée	7
	- modification des prix	25
Sans mesures financières :		
Persuasion	- information générale	27
	- efforts volontaires	9
	- programmes d'information et de formation gouvernementaux	13
	- programmes d'information et de formation des services publics	1
	- autres programmes d'information et de formation	4
Réglementation	- politique générale	12
	- rationnement	16
	- normes	15
	- étiquetage relatif à la consommation d'énergie	7

[a] Certaines études sont incluses dans plus d'une catégorie.

Table 9

Classification of Studies by Methodologies Used

SURVEY:

0012 0038 0039 0044 0407 0412 0413 0451 0456 0473
0814 0878 0949 0966 1221 1223 1228 1231 1236 1609
1637 2006 2007 2023 2100 2101 2102 2874 2882 2883
2897 2898 3603 4002 4021 4022 4023 4024 4044 4056
4400 4401 4422 4468 4472 4812 4813 4858 4878 5200
5236 5237 5400 5401 5402 5403 5600 5603 6018 6019
6021 6023 6024 6031 6036 6060 6836 6849 6864 7214
7227 7237 7239 7291 7293 7612 7620 7630 8011 8012
8035 8411 8811 8812 8819 8821 8826 9401 9420

CASE HISTORY:

0507 2022 2877 2884 7219 8030

EXPERIMENT (Before and After):

2804 2876 3601 4002 4018 4449 4469 5604 7239 7271
7272 7281 8406 8852 8854 8856

EXPERIMENT (After Only):

0037 0411 2491 2912 6017

DESCRIPTIVE (Program Evaluation):

0003 0009 0471 0506 0893 0961 1216 1227 1621 1629
2464 2862 2884 2886 2889 2891 2892 2893 2894 2899
2902 4000 4023 4026 4036 4431 4449 4843 4901 5238
5239 5607 6036 6829 6854 7212 7214 7238 7241 7612
8030 8035 8404

DESCRIPTIVE (Conceptualization):

0491 0492 0493 0494 0496 0497 0824 0893 1208 1209
1222 1224 1233 1639 1647 2422 2809 2896 2911 3602
4001 4436 4437 4449 4464 4819 4844 4862 6027 6826
6862 6874 7206 7299 8045 8407 8836 8851 8866

Table 9 (cont.)

DESCRIPTIVE (Other):

0472 0499 0516 0821 0879 0896 1214 1622 2009 2500
2864 2878 2881 2887 2888 2901 3608 4006 4041 4432
4816 4907 4908 5606 6022 6026 6050 6861 6863 7242
7306 7625 8021 8040 8853 9580

DIFFUSION:

1208 4401 4446 8856

ECONOMETRIC:

2809 2879 2907 7211 7213 7226 7236 7611

OTHER:

0441 0866 1621 2008 4022 4029 4422 4434 4814 5214
7273 8050

Tableau 9

Classification des études selon la méthode utilisée

ENQUÊTE :

0012 0038 0039 0044 0407 0412 0413 0451 0456 0473
0814 0878 0949 0966 1221 1223 1228 1231 1236 1609
1637 2006 2007 2023 2100 2101 2102 2874 2882 2883
2897 2898 3603 4002 4021 4022 4023 4024 4044 4056
4400 4401 4422 4468 4472 4812 4813 4858 4878 5200
5236 5237 5400 5401 5402 5403 5600 5603 6018 6019
6021 6023 6024 6031 6036 6060 6836 6849 6864 7214
7227 7237 7239 7291 7293 7612 7620 7630 8011 8012
8035 8411 8811 8812 8819 8821 8826 9401 9420

HISTOIRE DE CAS :

0507 2022 2877 2884 7219 8030

EXPÉRIENCE (avant et après) :

2804 2876 3601 4002 4018 4449 4469 5604 7239 7271
7272 7281 8406 8852 8854 8856

EXPÉRIENCE (après seulement) :

0037 0411 2491 2912 6017

ÉTUDE DESCRIPTIVE (évaluation de programme) :

0003 0009 0471 0506 0893 0961 1216 1227 1621 1629
2464 2862 2884 2886 2889 2891 2892 2893 2894 2899
2902 4000 4023 4026 4036 4431 4449 4843 4901 5238
5239 5607 6036 6829 6854 7212 7214 7238 7241 7612
8030 8035 8404

ÉTUDE DESCRIPTIVE (conceptualisation) :

0491 0492 0493 0494 0496 0497 0824 0893 1208 1209
1222 1224 1233 1639 1647 2422 2809 2896 2911 3602
4001 4436 4437 4449 4464 4819 4844 4862 6027 6826
6862 6874 7206 7299 8045 8407 8836 8851 8866

Tableau 9 (suite)

ÉTUDE DESCRIPTIVE (autres) :

0472 0499 0516 0821 0879 0896 1214 1622 2009 2500
2864 2878 2881 2887 2888 2901 3608 4006 4041 4432
4816 4907 4908 5606 6022 6026 6050 6861 6863 7242
7306 7625 8021 8404 8853 9580

DIFFUSION :

1208 4401 4446 8856

ÉCONOMÉTRIE :

2809 2879 2907 7211 7213 7226 7236 7611

AUTRES :

0441 0866 1621 2008 4022 4029 4422 4434 4814 5214
7273 8050

Table 10

Classification of Studies by Attitude/Behaviour Measures Employed

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ACTUAL BEHAVIOUR PATTERNS:

0012 0037 0411 0441 0491 0507 0814 0819 0878 1621
1639 2421 2804 2862 2874 2876 2877 2879 2883 2897
2901 2902 3601 3603 4001 4002 4018 4022 4023 4056
4446 4464 4468 4469 4813 4814 4816 4819 5214 5238
5239 5400 5402 5403 5604 5606 5607 6017 6023 6826
6849 6864 7219 7227 7238 7239 7272 7273 8011 8012
8045 8050 8406 8821 8852 8854 8856

SELF-REPORTED BEHAVIOUR:

0012 0037 0038 0039 0044 0407 0412 0413 0451 0473
0819 0878 1221 1223 1228 1231 1637 1639 2006 2007
2008 2023 2100 2101 2102 2421 2874 2876 2877 2879
2882 2897 2898 2912 3603 4001 4022 4023 4024 4044
4056 4400 4433 4437 4446 4449 4468 4472 4843 4858
5200 5237 5400 5401 5402 5403 5600 5603 5604 6018
6021 6023 6027 6031 6036 6060 6836 6849 6863 6864
7214 7227 7237 7291 7293 7612 7620 7630 8035 8812
8819 8826 8852 9401 9420

INTENTIONS TO CONSERVE/CONSUME:

0039 0413 0473 0949 1231 1637 2421 4056 4878 5236
5237 6019 6024 6031 6060 8826 9401

ATTITUDES (All Categories):

0012 0038 0039 0473 0497 0819 0878 0893 1214 1221
1231 1609 1621 1629 1637 1639 2100 2101 2102 2421
2874 2876 2883 3603 4001 4021 4022 4023 4024 4041
4044 4056 4400 4437 4446 4468 4472 4812 4843 4858
4878 5200 5236 5401 5600 5603 5604 5607 6018 6019
6021 6031 6849 6863 6864 7214 7239 7293 8035 8411
8811 8812 8819 8826 9420

DETAILS ON ATTITUDES TOWARDS:

Energy Crisis:

Belief/Knowledge:

0407 0413 0451 0456 2100 2102 2876 4044 4056 4468
5200 5236 5401 5604 6021 7237 8035 9420

Table 10 (cont.)

Seriousness:

0038 0413 0473 2102 2876 4023 4041 4044 4468 4858
5200 5236 5604 6021 7237 8035 9420

Causes/Blame:

0413 0451 0456 4044 4858 4878 7237

Individual's Role:

0038 0413 0473 1221 1231 2100 4044 4056 4437 4446
4468 4858 5200 8812

Government Role (General):

0413 0473 1231 4041 4044 4858 7237

Government Role (Specific Policy):

0413 0451 0456 0473 0819 1221 1231 4044 4858 8035
8811

New Technology:

1208 1214 2100 2102 4024 4044 4400 4472 6019 6863
8811 8819

Environment/Quality of Life:

0413 0473 1221 1609 4044 5200 8826

Lifestyle:

0413 0473 1609 4044 4446 7237 7620 8826

Various Conservation Strategies:

0039 0407 0878 1231 1629 1637 2101 2864 3603 4021
4022 4843 5401 5603 5607 5636 6864 8812

Tableau 10

Classification des études selon les mesures employées relativement aux attitudes et aux comportements

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COMPORTEMENTS RÉELS :

0012 0037 0411 0441 0491 0507 0814 0819 0878 1621
1639 2421 2804 2862 2874 2876 2877 2879 2883 2897
2901 2902 3601 3603 4001 4002 4018 4022 4023 4056
4446 4464 4468 4469 4813 4814 4816 4819 5214 5238
5239 5400 5402 5403 5604 5606 5607 6017 6023 6826
6849 6864 7219 7227 7238 7239 7272 7273 8011 8012
8045 8050 8406 8821 8852 8854 8856

COMPORTEMENTS SIGNALÉS PAR LES CONSOMMATEURS :

0012 0037 0038 0039 0044 0407 0412 0413 0451 0473
0819 0878 1221 1223 1228 1231 1637 1639 2006 2007
2008 2023 2100 2101 2102 2421 2874 2876 2877 2879
2882 2897 2898 2912 3603 4001 4022 4023 4024 4044
4056 4400 4433 4437 4446 4449 4468 4472 4843 4858
5200 5237 5400 5401 5402 5403 5600 5603 5604 6018
6021 6023 6027 6031 6036 6060 6836 6849 6863 6864
7214 7227 7237 7291 7293 7612 7620 7630 8035 8812
8819 8826 8852 9401 9420

INTENTIONS DE CONSOMMMER/D'ÉCONOMISER :

0039 0413 0473 0949 1231 1637 2421 4056 4878 5236
5237 6019 6024 6031 6060 8826 9401

ATTITUDES (toutes les catégories) :

0012 0038 0039 0473 0497 0819 0878 0893 1214 1221
1231 1609 1621 1629 1637 1639 2100 2101 2102 2421
2874 2876 2883 3603 4001 4021 4022 4023 4024 4041
4044 4056 4400 4437 4446 4468 4472 4812 4843 4858
4878 5200 5236 5401 5600 5603 5604 5607 6018 6019
6021 6031 6849 6863 6864 7214 7239 7293 8035 8411
8811 8812 8819 8826 9420

DÉTAILS SUR LES ATTITUDES FACE AUX ASPECTS SUIVANTS :

Crise énergétique :

Prise de conscience et connaissance de la situation :

0407 0413 0451 0456 2100 2102 2876 4044 4056 4468
5200 5236 5401 5604 6021 7237 8035 9420

Tableau 10 (suite)

Gravité :

0038 0413 0473 2102 2876 4023 4041 4044 4468 4858
5200 5236 5604 6021 7237 8035 9420

Causes et responsables :

0413 0451 0456 4044 4858 4878 7237

Rôle des consommateurs :

0038 0413 0473 1221 1231 2100 4044 4056 4437 4446
4468 4858 5200 8812

Rôle du gouvernement (en général) :

0413 0473 1231 4041 4044 4858 7237

Rôle du gouvernement (politiques particulières) :

0413 0451 0456 0473 0819 1221 1231 4044 4858 8035
8811

Technologie nouvelle :

1208 1214 2100 2102 4024 4044 4400 4472 6019 6863
8811 8819

Environnement et qualité de vie :

0413 0473 1221 1609 4044 5200 8826

Mode de vie :

0413 0473 1609 4044 4446 7237 7620 8826

Stratégies diverses de maîtrise de l'énergie :

0039 0407 0878 1231 1629 1637 2101 2864 3603 4021
4022 4843 5401 5603 5607 5636 6864 8812

Table 11

Classification of Studies by Activity Area

HOME RELATED:

General:

0003 0009 0038 0407 0412 0413 0456 0471 0472 0473
0499 0506 0516 0878 0896 0949 1208 1214 1216 1223
1224 1227 1228 1231 1621 1622 1637 1639 2006 2007
2022 2100 2421 2422 2464 2500 2864 2874 2876 2879
2883 2886 2887 2888 2891 2892 2893 2898 2899 2907
3603 3608 4001 4002 4018 4021 4022 4026 4056 4400
4401 4431 4436 4437 4446 4464 4811 4812 4814 4816
4819 4844 4858 4895 4907 5236 5400 5402 5403 5603
5604 5606 6018 6022 6023 6036 6849 6861 6874 7213
7214 7226 7227 7236 7237 7239 7272 7273 7293 7306
7611 7612 7620 7630 8011 8012 8021 8407 8811 8812
8821 8836 8853 8854 8866

Space Heating:

0039 0441 0451 0814 0824 2023 2108 2862 2894 2897
2902 2912 4022 4024 4401 4468 4472 4843 5238 5239
5401 6027 6060 6836 6861 6864 7226 7238 7271 7281
7612 7620 8411 8826 8852 8856 9401

Space Cooling:

0814 1629 2897 4843 5214 6017 6861 7226 8821 8852
8854 8856 9401

Water Heating:

0814 1629 2102 2894 2897 2912 4401 6019

Appliances:

0012 0037 0472 0814 1639 2874 2884 2892 2893 2894
2897 2899 4002 4036 4843 8821 9401

Other:

0472 1236 8406

Table 11 (cont.)

TRANSPORTATION RELATED:

Private Automobile:

0044 0451 0456 0473 0491 0492 0493 0494 0496 0819
0824 0866 1221 1233 1639 2006 2007 2008 2009 2804
2826 2882 2907 4023 4029 4433 4434 4812 4843 5237
6024 6031 6849 7206 7219 7226 7236 7237 7291 7625
8030 8035 8050 8836

Van/Carpools:

0473 0492 0493 0494 2009 2826 2882 3601 4433 5607
6024 8030 8035 8050 8404

Public Transportation:

0491 0492 0493 0494 0496 0866 2008 2009 2826 2882
6026 6050 7236 8030 8035 8050

Vacation/Leisure Travel:

0473 0492 0493 0494 0496 0821 2006 4434 7237 8030
8050

Other:

0413 0494 0496 1622 2422 4813 6862 7212 8035 9580

LIFESTYLE RELATED:

0411 0413 0473 0824 1228 1609 1639 2007 2878 2894
4002 4895 4908 5236 6031 6849 6861 7236 7620

OTHER:

General Energy Conservation:

0497 0879 0961 2101 2896 2911 3602 4006 4024 4041
4044 4422 4464 4862 4878 5200 5600 6826 6829 6854
6863 7211 7306 8040 8050 8819 8851

Non-Residential with Behavioural Implications:

2877 2887 4469 6021

Tableau 11

Classification des études selon les secteurs d'activité

MAISON :

Habitation en général :

0003 0009 0038 0407 0412 0413 0456 0471 0472 0473
0499 0506 0516 0878 0896 0949 1208 1214 1216 1223
1224 1227 1228 1231 1621 1622 1647 1639 2006 2007
2022 2100 2421 2422 2464 2500 2864 2874 2876 2879
2883 2886 2887 2888 2891 2892 2893 2898 2899 2907
3603 3608 4001 4002 4018 4021 4022 4026 4056 4400
4401 4431 4436 4437 4446 4464 4811 4812 4814 4816
4819 4844 4858 4895 4907 5236 5400 5402 5403 5603
5604 5606 6018 6022 6023 6036 6849 6861 6874 7213
7214 7226 7227 7236 7237 7239 7272 7273 7293 7306
7611 7612 7620 7630 8011 8012 8021 8407 8811 8812
8821 8836 8853 8854 8866

Chauffage :

0039 0441 0451 0814 0824 2023 2108 2862 2894 2897
2902 2912 4022 4024 4401 4468 4472 4843 5238 5239
5401 6027 6060 6836 6861 6864 7226 7238 7271 7281
7612 7620 8411 8826 8852 8856 9401

Climatisation :

0814 1629 2897 4843 5214 6017 6861 7226 8821 8852
8854 8856 9401

Eau chaude :

0814 1629 2102 2894 2897 2912 4401 6019

Appareils ménagers :

0012 0037 0472 0814 1639 2874 2884 2892 2893 2894
2897 2899 4002 4036 4843 8821 9401

Autres :

0472 1236 8406

Tableau 11 (suite)

TRANSPORTS :

Voiture personnelle :

0044 0451 0456 0473 0491 0492 0493 0494 0496 0819
0824 0866 1221 1233 1639 2006 2007 2008 2009 2804
2826 2882 2907 4023 4029 4433 4434 4812 4843 5237
6024 6031 6849 7206 7219 7226 7236 7237 7291 7625
8030 8035 8050 8836

Covoiturage (auto ou camionnette) :

0473 0492 0493 0494 2009 2826 2882 3601 4433 5607
6024 8030 8035 8050 8404

Transports en commun :

0491 0492 0493 0494 0496 0866 2008 2009 2826 2882
6026 6050 7236 8030 8035 8050

Déplacement (loisirs - vacances) :

0473 0492 0493 0494 0496 0821 2006 4434 7237 8030
8050

Autres :

0413 0494 0496 1622 2422 4813 6862 7212 8035 9580

MODE DE VIE :

0411 0413 0473 0824 1228 1609 1639 2007 2878 2894
4002 4895 4908 5236 6031 6849 6861 7236 7620

AUTRES :

Maîtrise de l'énergie en général :

0497 0879 0961 2101 2896 2911 3602 4006 4024 4041
4044 4422 4464 4862 4878 5200 5600 6826 6829 6854
6863 7211 7306 8040 8050 8819 8851

Secteur non résidentiel avec aspects touchant le comportement :

2877 2887 4469 6021

Table 12

Classification of Studies by Energy Form

ELECTRICITY:

0009 0012 0037 0039 0441 0456 0471 0841 1227 1621
1629 1639 2009 2022 2874 2876 2879 2883 2884 2886
2892 2893 2897 2899 2907 2912 3603 4002 4018 4036
4056 4431 4464 4469 4811 4814 4819 4843 4907 5214
5400 5401 5402 5403 5603 5604 6017 6018 6019 6050
6836 6849 7206 7213 7214 7226 7237 7238 7239 7271
7272 7273 7293 7611 7620 7625 8030 8035 8050 8406
8812 8821 8852 8854 8856 9401

GASOLINE:

0044 0451 0456 0491 0492 0493 0494 0496 0507 0819
0821 0824 0866 1221 1233 1639 2008 2804 2826 2882
2907 3601 4000 4023 4029 4433 4434 4449 4472 4819
4843 5237 5606 6024 6026 6050 6849 6862 7211 7213
7219 7226 7237 7291 7620 8404 8812 8836 9580

NATURAL GAS:

0003 0441 0814 1621 1637 2886 2896 2897 2912 4431
4446 4468 5214 5400 5401 5403 6027 6849 7213 7226
7271 7281 7620 8411

FUEL OIL:

0038 0039 2862 2877 2896 2897 2899 2912 4000 4819
4843 5238 5239 5607 6849 6864 7211 7213 7226 7271
7620 8836

SOLAR:

0896 1214 2007 2102 4024 4400 4401 4436 6060 6854
7226 7306 7620 8811

WOOD:

0878 2022 3603 6060 8826

NUCLEAR:

6863 7213 8819

Table 12 (cont.)

COAL:

0471 7213 7226

OTHER:

0496 1214

OTHER — GENERAL:

0038 0407 0413 0451 0456 0471 0472 0499 0506 0516
0824 0879 0893 0949 0961 1208 1216 1222 1223 1224
1227 1228 1231 1609 1622 1639 1647 2006 2023 2100
2101 2421 2422 2464 2500 2809 2862 2864 2878 2881
2887 2888 2889 2891 2892 2893 2894 2898 2899 2901
2902 2911 3602 3608 4001 4006 4021 4022 4026 4037
4041 4044 4422 4464 4812 4816 4844 4858 4862 4878
4895 4901 4906 4908 5200 5207 5236 5600 5603 6021
6022 6023 6036 6060 6826 6829 6861 6874 7213 7226
7227 7236 7241 7242 7612 7620 7630 8011 8012 8021
8040 8045 8407 8836 8851 8853 8868 9420

Tableau 12

Classification des études selon la forme d'énergie

ÉLECTRICITÉ :

0009 0012 0037 0039 0441 0456 0471 0841 1227 1621
1629 1639 2009 2022 2874 2876 2879 2883 2884 2886
2892 2893 2897 2899 2907 2912 3603 4002 4018 4036
4056 4431 4464 4469 4811 4814 4819 4843 4907 5214
5400 5401 5402 5403 5603 5604 6017 6018 6019 6050
6836 6849 7206 7213 7214 7226 7237 7238 7239 7271
7272 7273 7293 7611 7620 7625 8030 8035 8050 8406
8812 8821 8852 8854 8856 9401

ESSENCE :

0044 0451 0456 0491 0492 0493 0494 0496 0507 0819
0821 0824 0866 1221 1233 1639 2008 2804 2826 2882
2907 3601 4000 4023 4029 4433 4434 4449 4472 4819
4843 5237 5606 6024 6026 6050 6849 6862 7211 7213
7219 7226 7237 7291 7620 8404 8812 8836 9580

GAZ NATUREL :

0003 0441 0814 1621 1637 2886 2896 2897 2912 4431
4446 4468 5214 5400 5401 5403 6027 6849 7213 7226
7271 7281 7620 8411

MAZOUT :

0038 0039 2862 2877 2896 2897 2899 2912 4000 4819
4843 5238 5239 5607 6849 6864 7211 7213 7226 7271
7620 8836

ÉNERGIE SOLAIRE :

0896 1214 2007 2102 4024 4400 4401 4436 6060 6854
7226 7306 7620 8811

BOIS :

0878 2022 3603 6060 8826

ÉNERGIE NUCLÉAIRE :

6863 7213 8819

Tableau 12 (suite)

CHARBON :

0471 7213 7226

AUTRES :

0496 1214

AUTRES — ÉTUDES GÉNÉRALES :

0038 0407 0413 0451 0456 0471 0472 0499 0506 0516
0824 0879 0893 0949 0961 1208 1216 1222 1223 1224
1227 1228 1231 1609 1622 1639 1647 2006 2023 2100
2101 2421 2422 2464 2500 2809 2862 2864 2878 2881
2887 2888 2889 2891 2892 2893 2894 2898 2899 2901
2902 2911 3602 3608 4001 4006 4021 4022 4026 4037
4041 4044 4422 4464 4812 4816 4844 4858 4862 4878
4895 4901 4906 4908 5200 5207 5236 5600 5603 6021
6022 6023 6036 6060 5826 6829 6861 6874 7213 7226
7227 7236 7241 7242 7612 7620 7630 8011 8012 8021
8040 8045 8407 8836 8851 8853 8868 9420

Table 13

Classification of Studies by Product/Service Target

RETROFIT (Insulation):

0407 0451 0456 0814 0824 1223 1227 1228 2006 2100
2421 2464 2892 2893 2894 2897 2898 2899 2902 2912
4022 4446 4907 6027 6036 7226 7238 7271 7281 7612
7620 8411

RETROFIT (Furnace):

0038 0039 0814 2100 2862 2897 2912 4907 5238 7226
7271

APPLIANCES:

0012 0037 0407 0814 2421 2804 2884 2892 2893 2894
2897 2899 4002 4036 6017 7226 7237 7620 8821

CONSERVATION DEVICES:

0451 0814 1208 1223 2007 2102 2902 2912 4446 4472
4907 6864 8854

HOME AUDITS:

0471 0506 1228 2886 2891 4056 4431 4907 5401 7214
7612 8812

COMMERCIAL AUDITS:

2877 2902

AUTOMOBILES:

0044 0451 0492 0819 0824 2006 2826 2882 2907 4023
4029 4433 5237 6024 6031 6849 7226 7236 7237 7291
7625 8836

OTHER:

New Technology:

1214 2009 2102 4400 4436 7306 8811

Acceptance/Awareness of Various Conservation Strategies:

0441 0492 0878 0896 0507 1223 1228 1231 1622 1629
2006 2008 2023 2100 2101 2464 2864 2874 2911 3608
4018 4446 4858 5214 5237 5603 5607 6023 7219 7242
7612 8853 8856 9401

Miscellaneous:

1621 1637 4816 6836 6862

Tableau 13

Classification des études selon les produits ou les services visés

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TRANSFORMATION (isolation) :

0407 0451 0456 0814 0824 1223 1227 1228 2006 2100
2421 2464 2892 2893 2894 2897 2898 2899 2902 2912
4022 4446 4907 6027 6036 7226 7238 7271 7281 7612
7620 8411

TRANSFORMATION (chauffage central) :

0038 0039 0814 2100 2862 2897 2912 4907 5238 7226
7271

APPAREILS MÉNAGERS :

0012 0037 0407 0814 2421 2804 2884 2892 2893 2894
2897 2899 4002 4036 6017 7226 7237 7620 8821

DISPOSITIFS ÉCONOMISEURS D'ÉNERGIE :

0451 0814 1208 1223 2007 2102 2902 2912 4446 4472
4907 6864 8854

VÉRIFICATION DES MAISONS :

0471 0506 1228 2886 2891 4056 4431 4907 5401 7214
7612 8812

VÉRIFICATION DES ÉTABLISSEMENTS COMMERCIAUX :

2877 2902

AUTOMOBILES:

0044 0451 0492 0819 0824 2006 2826 2882 2907 4023
4029 4433 5237 6024 6031 6849 7226 7236 7237 7291
7625 8836

AUTRES :

Technologie nouvelle :

1214 2009 2102 4400 4436 7306 8811

Acceptation/connaissance des stratégies de maîtrise de l'énergie :

0441 0492 0878 0896 0507 1223 1228 1231 1622 1629
2006 2008 2023 2100 2101 2464 2864 2874 2911 3608
4018 4446 4858 5214 5237 5603 5607 6023 7219 7242
7612 8853 8856 9401

Divers :

1621 1637 4816 6836 6862

Table 14

Classification of Studies by Type of Energy Policy

FINANCIAL-PERSUASIVE:

General Information:

0473 1222 2892 2893 2899 4006 4432 4468 6874 7226
7238 8811

Voluntary Efforts:

0451 2894 4468

Tax Credits:

0456 0492 0824 2809 2826 2892 2893 2894 2896 2899
4006 4843 5600 6031 6036 7226 8811

Rebates:

0038 0472 0492 1647 2862 2892 2893 2899 4843 5600
7272 8866

Billing Plans:

0003 0009 0456 0471 0473 0499 1621 2826 4002 4026
7211 7611 8821

FINANCIAL-REGULATORY:

General Policy:

0044 0451 1216 2809 2826 2864 4432 4862 5600 7212
8035

Time-of-Day Pricing:

0009 1227 2874 2876 4002 6017 7611

Price Changes:

0003 0451 0473 0492 0499 0824 1233 2809 2826 2864
2883 2896 2907 4000 4041 5600 6031 7211 7213 7226
7236 7611 7620 8821 8836

Table 14 (cont.)

NONFINANCIAL-PERSUASIVE:

General Information:

0037 0472 0473 0492 0494 0819 1647 2421 2864 2892
2893 2896 2899 2911 2912 4006 4436 4468 4469 4843
4862 5600 6874 7226 7612 8030 8406

Voluntary Efforts:

0473 0492 0819 4437 4468 5600 7620 8030 8035

Government Information/Education Programs:

0473 0492 1216 1222 1637 2896 2911 2912 4023 5238
5239 5600 8404

Utility Information/Education Programs:

0471

Other Information/Education Programs:

1621 7239 8404 8854

NONFINANCIAL-REGULATORY:

General Policy:

0451 0473 0494 1216 4041 4432 4862 5600 6024 7219
8030 8035

Rationing:

0044 0451 0456 0473 0492 0494 0496 0824 2907 5600
6017 6024 7226 7237 8030 8035

Standards:

0456 0473 0492 0824 1227 2892 2893 2894 2896 2899
4029 4843 5600 6861 7237

Energy Labelling:

0037 0819 2884 2894 2896 4036 4843

Tableau 14

Classification des études selon le type de politique énergétique

---

AVEC MESURES FINANCIÈRES - PERSUASION :

Information générale :

0473 1222 2892 2893 2899 4006 4432 4468 6874 7226
7238 8811

Efforts volontaires :

0451 2894 4468

Crédits d'impôt :

0456 0492 0824 2809 2826 2892 2893 2894 2896 2899
4006 4843 5600 6031 6036 7226 8811

Remises :

0038 0472 0492 1647 2862 2892 2893 2899 4843 5600
7272 8866

Plans de facturation :

0003 0009 0456 0471 0473 0499 1621 2826 4002 4026
7211 7611 8821

AVEC MESURES FINANCIÈRES - RÉGLEMENTATION

Politique générale :

0044 0451 1216 2809 2826 2864 4432 4862 5600 7212
8035

Fixation des prix selon le moment de la journée :

0009 1227 2874 2876 4002 6017 7611

Modification des prix :

0003 0451 0473 0492 0499 0824 1233 2809 2826 2864
2883 2896 2907 4000 4041 5600 6031 7211 7213 7226
7236 7611 7620 8821 8836

Tableau 14 (suite)

SANS MESURES FINANCIÈRES - PERSUASION :

Information générale :

0037 0472 0473 0492 0494 0819 1647 2421 2864 2892
2893 2896 2899 2911 2912 4006 4436 4468 4469 4843
4862 5600 6874 7226 7612 8030 8406

Efforts volontaires :

0473 0492 0819 4437 4468 5600 7620 8030 8035

Programmes gouvernementaux d'information et de formation :

0473 0492 1216 1222 1637 2896 2911 2912 4023 5238
5239 5600 8404

Programmes d'information et de formation des services publics :

0471

Autres programmes d'information et de formation :

1621 7239 8404 8854

SANS MESURES FINANCIÈRES - RÉGLEMENTATION :

Politique générale :

0451 0473 0494 1216 4041 4432 4862 5600 6024 7219
8030 8035

Rationnement :

0044 0451 0456 0473 0492 0494 0496 0824 2907 5600
6017 6024 7226 7237 8030 8035

Normes :

0456 0473 0492 0824 1227 2892 2893 2894 2896 2899
4029 4843 5600 6861 7237

Étiquetage relatif à la consommation d'énergie :

0037 0819 2884 2894 2896 4036 4843

Table 15/Tableau 15

Journals Referenced in Bibliography
Périodiques mentionnés dans la bibliographie

American Journal of Agricultural Economics

American Journal of Political Science

American Psychologist

Annual Review of Energy

ASHRAE Journal

Behavior Modification

Bell Journal of Economics

Energy

Energy and Buildings

Energy Communications

Energy Policy

Energy Systems and Policy Environment

Energy -- The International Journal

Environment and Behavior

Evaluation Review

Housing and Society

Journal of Advertising

Journal of Applied Behavioural Analysis

Journal of Community Psychology

Journal of Consumer Affairs

Journal of Consumer Research

Journal of Consumer Studies and Home Economics

Journal of Econometrics

Journal of Energy and Development

Journal of Environmental Economics and Management

Journal of Environmental Education

Journal of Environmental Systems

Journal of Social Issues

Management Science

Public Administration Review
Public Opinion Quarterly
Public Policy
Public Utilities Fortnightly
Quarterly Review of Economics and Business
Review of Economics and Statistics
Science
Scientometrics
The New England Journal of Business and Economics
The Public Interest
Transportation
Transportation Research
Transportation Research Record
Vakbloid voor Huishondkunde
Zeitschrift für Umweltpolitik

Table 16

Conference Proceedings Referenced in Bibliography

Published Proceedings:

American Institute for Decision Sciences

American Marketing Association

Association for Consumer Research

National Conference on Technology for Energy Transfer

Unpublished Proceedings:

American Association for the Advancement of Science

American Council for an Energy-Efficient Economy

American Council on Consumer Interests

Annual Colloquium of Economic Psychology

Annual Conference of the Rural Sociological Society

International Communication Association

International Conference on Consumer Behavior and Energy Policy (Netherlands)

National Bureau of Economic Research Conference on Social Experimentation

Small City and Regional Community Economic and Energy Futures Conference

Transportation Research Board

Tableau 16

Actes de conférences mentionnés dans la bibliographie

Actes publiés :

American Institute for Decision Sciences

American Marketing Association

Association for Consumer Research

National Conference on Technology for Energy Transfer

Actes non publiés :

American Association for the Advancement of Science

American Council for an Energy-Efficient Economy

American Council on Consumer Interests

Annual Colloquium of Economic Psychology

Annual Conference of the Rural Sociological Society

Association internationale des communications

Conférence internationale sur les comportements des consommateurs et les politiques énergétiques (Pays-Bas)

National Bureau of Economic Research Conference on Social Experimentation

Small City and Regional Community Economic and Energy Futures Conference

Transportation Research Board

Table 17

Other Sources Referenced in Bibliography

Government: various governments and departments within governments including:

- Consumer and Corporate Affairs Canada
- Department of Industry and Energy (Dublin)
- Province (Canada) and State (U.S.) Energy Departments and Agencies
- U.S. Department of Energy
- U.S. Department of Transportation

Universities: various published and unpublished reports from universities including:

- Center for Environmental Studies, Macquarie University
- Center for Policy Alternatives, Massachusetts Institute of Technology
- Division of Research of the School of Management, University of Minnesota
- Eagleton Institute of Politics, Rutgers University
- Energy and Environmental Policy Center, Harvard University
- Energy Research Center, University of Wisconsin-Madison
- Institute for Social and Policy Studies, Yale University
- Institute for Urban and Regional Research, University of Iowa

Private Sector/Other:

- Economic Council of Canada
- Electric Power Research Institute
- Manitoba Hydro
- National Research Council, National Academy of Sciences
- National Technical Information Service
- Nebraska Public Power District
- Northern States Power Company
- Ontario Hydro
- Puget Sound Power and Light Company
- San Diego Gas and Electric
- Seattle City Light
- Snohomish County Public Utilities
- Washington Water Power Company

Tableau 17

Autres sources mentionnées dans la bibliographie

Gouvernement : divers gouvernements et ministères, dont les suivants :

Consommation et Corporations Canada
Department of Industry and Energy (Dublin)
Agences et ministères provinciaux (Canada) et d'État (É.-U.) de l'énergie
U.S. Department of Energy
U.S. Department of Transportation

Universités : divers rapports publiés et non publiés des universités, dont les suivants :

Center for Environmental Studies, Macquarie University
Center for Policy Alternatives, Massachusetts Institute of Technology
Division of Research of the School of Management, University of Minnesota
Eagleton Institute of Politics, Rutgers University
Energy and Environmental Policy Center, Harvard University
Energy Research Center, University of Wisconsin-Madison
Institute for Social and Policy Studies, Yale University
Institute for Urban and Regional Research, University of Iowa

Secteur privé et autres :

Conseil économique du Canada
Electric Power Research Institute
Hydro Manitoba
National Research Council, National Academy of Sciences
National Technical Information Service
Nebraska Public Power District
Northern States Power Company
Hydro Ontario
Puget Sound Power and Light Company
San Diego Gas and Electric
Seattle City Light
Snohomish County Public Utilities
Washington Water Power Company

BIBLIOGRAPHY/BIBLIOGRAPHIE

0003

Adriaansen, W.L.M.
1982 Some Reflections on the Price of Natural Gas for Consumers. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper discusses the natural gas policy in the Netherlands, with particular emphasis on the pricing of natural gas for small consumers. The analysis is based on an advisory study on the use of natural gas prepared for the Minister of Economic Affairs. The present Dutch natural gas policy (particularly pricing policy) is described and implications for future policy are examined.

0009

Aigner, Dennis J.
1981 The Residential Electricity Time-of-Use Pricing Experiments: What Have We Learned?
Presented at the National Bureau of Economic Research's Conference on Social Experimentation, Hilton Head Island, S.C., March 5-7, 1981.

Abstract: Over a period of six years, the U.S. Department of Energy (DOE) has been engaged in a cooperative program of residential time-of-use (TOU) rate experiments, involving time-of-day or seasonally varying prices. The main goal of this program of experimentation was to determine whether TOU pricing would produce sufficient alternations in the load curves of residential customers to justify implementation of such rates. This justification involves three specific effects: the revenue impact on the utility, the amount of capacity reduction implied, and changes in consumer welfare. The experiments were designed, to a lesser or greater degree, in order to address one or more of these issues. As such, a number of design considerations impact on the ultimate usefulness of the experimental data that have been forthcoming.

This paper considers the empirical results available so far from 15 DOE experiments in light of design and analysis concerns and the goals the experiments were ostensibly designed to serve. This is done by focusing on price elasticities as the important summary parameters of interest, since they feed directly into calculations of welfare and revenue impacts and impinge on the matter of rate design itself.

0012

Aldershoff, Danielle, and Heimrich Kanis
1982 Energy Use in Households: A Socio-Technical Study. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: The Foundation for Consumer Research (SWOKA), The Netherlands, is conducting research within the field of household energy consumption based on the following problem definition. How is energy consumed within the household? How can energy savings be achieved here without eroding existing lifestyles? And, what conclusions do these findings have for policy measures? The article describes the results of an exploratory study of appliance usage and energy consumption by product. An attempt is made to relate energy-relevant usage behaviour to factors such as household composition, financial resources and attitudes to energy use and conservation. The results are useful for an evaluation of policy instruments such as the establishment of energy consumption standards and consumer information programs.

0037

Anderson, C. Dennis, and John D. Claxton
1982 Barriers to Consumer Choice of Energy Efficient Products. Journal of Consumer Research, 9, 163-170.

Objective: To assess the impact of the following factors on consumers' refrigerator purchase decisions: energy labels, emphasis on energy efficiency by retail salespeople and the type of energy information supplied.

Method: A field experiment was conducted using 18 stores of a major national department store chain located in ten cities in western Canada. Stores were judgementally clustered according to size, geographic region and local socioeconomic characteristics. Twelve stores were randomly assigned to four different information treatments and six stores to a control condition. The analysis is based on the responses of 298 refrigerator-purchasing consumers to a mail questionnaire. This represents a response rate of 53%.

Variables: Independent: type of energy information.

Dependent: nature of the purchase decision, awareness of energy information, salience of energy information in refrigerator choice.

Findings/implications: The presence of energy information has a significant impact on the purchase of small, energy-efficient refrigerators. Although energy label type and sales force emphasis had no differential impact, all information conditions indicated purchases that were more energy-efficient than purchases in control stores.

A number of barriers deter consumers from making energy-conserving choices when buying major durables. In view of these barriers and the findings of the field experiment, the authors make a number of suggestions for future point-of-sale energy programs and future research.

0038

Anderson, C. Dennis, Nina L. Colwill, and Perry Kent
1982 An Initial Evaluation of the Canada Oil Substitution Program: Converter and Nonconverter Profiles.
Prepared for Consumer and Corporate Affairs Canada.

Objective: To provide an initial evaluation of the impact of the Canada Oil Substitution Program (COSP) on off-oil conversion decisions.

Method: Detailed questionnaires were mailed to "converters" (i.e., those who had changed from oil to another source of home heating since the announcement date of COSP) and "nonconverters" (i.e., those who continued to heat with oil). Responses were obtained from 1,050 converters and 379 nonconverters from the provinces of Quebec, Ontario, Manitoba and British Columbia.

Variables: Independent: home and heating system characteristics; demographic and socioeconomic variables; COSP-specific measures; attitudes toward the energy situation and energy conservation; conversion motives, concerns, barriers; fuel perceptions.

Dependent: conversion probability, conversion decision.

Findings/implications: (1) Both converters and nonconverters ranked the fear of high future oil prices as the primary reason for converting or considering conversion. Potential oil shortages was a far less significant conversion motive.

(2) Nearly one-half of the nonconverters strongly agreed that they could not afford to convert, even with financial assistance from the government or their utilities.

(3) Middle-income respondents tended to be the most energy-conscious and the most likely to convert. It appeared that there were two distinct conversion-resistant subsegments: low-income and high-income.

(4) Respondents were, in general, quite aware that COSP pays 50% of the conversion costs up to $800.00, but they were far less aware of other features of COSP.

The authors conclude that COSP should not be discontinued and make several recommendations for program management as well as future research.

0039

Anderson, C. Dennis, J.D. Wharton, B. Gibbs, and R. Cone
1980 The Prospects for Conversion to Electric Space Heating: A Study of Perceptions and Behaviors of Manitoba Householders. Prepared for Manitoba Hydro, Winnipeg, Man.

Objective: To investigate the likelihood that consumers will respond to the current oil price/availability problem by converting to electrical residential heating systems.

Method: The major focus of the analysis was on interviews conducted with two groups of Manitoba householders: electric heating system users (past converters, N = 107) and oil heating system users (potential future converters, N = 50).

Variables: Independent: demographics, housing characteristics, experiences and familiarity with various heating systems, perceptions of noncost heating system attributes, perceptions of heating system costs, and conversion experiences and reasons for conversion.

Dependent: type of heating system.

Findings/implications: It is apparent that, at the time the study was conducted, the difference in operating costs between electric heating and oil heating was not a major factor in the conversion decision process. Consequently, any conversion planning model based solely on operating cost differences would be naive. The decision on whether or not to convert should be viewed as a function of a number of factors, many of them situational (e.g., new home, breakdown in old system). Furthermore, once a decision to convert has been made, equipment factors and quality of heat factors have as much or more impact than do cost factors on the choice of heating system.

Oil users (as potential converters) have a number of perceptions about electric heating that are very encouraging; however, there are also several important barriers to conversion.

The authors conclude that rapid conversion to electric heating should not be expected as a direct consequence of rising oil prices. Instead, the conversion rate will depend more on other changes (such as a program to subsidize installation costs) and the natural aging of current oil systems.

0044

Archibald, Robert, and Robert Gillingham
1981 The Distributional Impact of Alternative Gasoline Conservation Policies.
Bell Journal of Economics, 12, 2, 426-444.

Objective: To develop a methodology for evaluating the direct distributional impacts of energy conservation plans.

Method: In 1980, data were collected at the micro level on a substantial number of demographic characteristics as well as local energy (gasoline) prices and household-specific income figures.* The study focuses on the impact of excise taxes or white-market coupon rationing on household gasoline consumption.

Variables: Independent: demographics, treatment, total household consumption expenditure, price of gasoline, number of automobiles.

Dependent: gasoline consumption.

Findings/implications: (1) Gasoline price increases are regressive, because they place the largest burden on the lowest-income classes. The authors imply that some form of gasoline tax redistribution is needed.

(2) All coupon plans in fact turn out to be subsidies to the lower-income classes.

(3) A coupon rationing program based on the number of automobiles in the household is likely to be ineffective.

(4) A plan which combines a tax with a separate redistribution may lessen the operational difficulties inherent in achieving a particular redistribution objective.

(5) The study ignores the indirect impact of higher gasoline prices, as gasoline is an input into production. Also the authors ignore the question of allocation between the business sector and the household sector.

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*For a detailed description of the sample and data collection procedures, the authors refer the interested reader to R.B. Archibald and R. Gillingham, An Analysis of the Short-Run Consumer Demand for Gasoline Using Household Survey Data. Review of Economics and Statistics, 62, November 1980, 622-628.

0407

Bagshaw, Mary
1982 Domestic Energy Conservation and the Consumer.
Journal of Consumer Studies and Home Economics, 6, 183-190.

Objective: To identify those factors which influence energy conservation behaviour in household members.

Method: A questionnaire was administered to female respondents (N = 49) living in a housing development on the outskirts of Leeds.

Variables: Independent: demographics, energy-related knowledge and attitudes.

Dependent: conservation practices.

Findings/implications: The survey showed that, among working-class women, the need to reduce fuel costs, or at least prevent them from escalating quickly, is the greatest incentive to conservation. Knowledge of where and how heat is lost from the house is poor, and there is little awareness among these women of the need for insulation. Conservation practices in cooking are poor and, among those better off financially, there is a tendency toward careless use of hot water. Most women do not appear to have the knowledge to make energy-efficient choices between various fuels and appliances. The knowledge level of women over 60 is significantly lower than that of younger women.

Baird, John S. Jr. 0411
1982 Conservation of the Commons: Effects of Group Cohesiveness and Prior Sharing.
Journal of Community Psychology, 10, July, 210-215.

Objective: To test the hypothesis that increasing group cohesiveness and exposing subjects to prior sharing would increase cooperative responding in a simulated commons problem.

Method: Undergraduate students (N = 60) in groups of three drew quarters from a regenerating resource pool.

Variables: Independent: high cohesiveness versus low cohesiveness, prior sharing versus no prior sharing.

Dependent: amount of money earned ("harvest"), amount of money replenished to the resource pool ("production").

Findings/implications: Groups which had previously shared a monetary reward were able to preserve the resource more effectively and earned more money than groups which had not shared a previous reward. The traditional cohesiveness manipulation was not successful. The results suggest that prior exposure to cooperative alternatives may enhance the cooperative response in later problem situations. The practical and theoretical implications of conservation strategies are mentioned.

0412

Barnett, Betty Ann, and Mohamed Abdel-Ghany
1980 Electricity: Use Patterns of Households.
Presented to the American Council on Consumer Interests, 26th Annual Conference, 1980.

Objectives: (1) To determine patterns of electricity use by households occupying all-electric housing units; and (2) to demonstrate how various social and economic characteristics of families may affect the quantity of electricity used.

Method: The data were supplied by 76 all-electric residential households in Madison County, Alabama, in response to a mail questionnaire.

Variables: Independent: appliance usage data, various socioeconomic and demographic variables, housing characteristics.

Dependent: electricity consumption.

Findings/implications: The results of multiple regression analyses revealed significant responsiveness with the expected sign of total electricity used in terms of kilowatt hours to the determining variables of household income, household size and appliance stock. Husband's education as a proxy for the family lifestyle, number of rooms in the housing unit and the wife's employment status did not affect the total amount of electricity used in the home. The authors stress the need for further research to validate these findings.

Bartell, Ted 0413
1976 Political Orientations and Public Response to the Energy Crisis.
Social Science Quarterly, 57, 430-436.

Objective: To examine the energy crisis in its political context.

Method: The author utilized a probability sample of 1,069 Los Angeles county adults interviewed on energy-related matters between February 12 and March 31, 1974. Respondent percentages were found to compare favourably with 1970 census data on characteristics such as ethnicity, age, sex, education, occupation and home ownership.

Variables: Independent: socioeconomic and demographic characteristics of the sample.

Dependent: beliefs with respect to the severity and duration of the energy shortage; blame for the crisis; perceptions of governmental institutions; preferences for various policies; expectations for the future; energy-reducing steps taken at the time of the crisis; changes in mode of transportation, personal difficulties.

Findings/implications: Only 20% of respondents believed the crisis to be severe, and a third of these believed the situation would last less than a year. Blame for the crisis was apportioned as follows: 30% on the oil companies, 15% on the federal government, 14% on the president. Attitudes toward the president were strongly related to attitudes toward the government. However, the hypothesis that there would be a relationship between level of political trust and the likelihood of undertaking energy-reducing steps was not confirmed. Persons of lower political trust were less likely to perceive the energy crisis as real or serious, but were more likely to perceive it as enduring. The only significant predictor of personal energy conservation appeared to be the anticipated effect on one's own employment. In short, there is a lack of attitude/behaviour consistency, although the author admits this may be an artifact of the measurement strategy employed. It was also found that, in general, blacks, women and persons of lower socioeconomic status more often blamed the president, whereas men and nonblacks more often blamed the oil companies.

0441

Beckey, Thomas, and Lorne W. Nelson
1981 Field Test of Energy Savings with Thermostat Setback.
Ashrae Journal, January, 67-70.

Objectives: (1) To determine the effectiveness of dual thermostat setback (setting the thermostat back at night and during the day) as a means of saving energy during the heating season; and (2) to compare energy savings achieved by thermostat setback in actual homes to the savings predicted by computer simulation.

Method: A field test was conducted on six single-storey Oklahoma homes. Data for the analysis were collected over two heating seasons.

Variables: Indoor and outdoor temperatures, furnace hours, total gas and electricity consumption.

Findings/implications: The results indicate that the use of thermostat setback in typical, family-occupied houses will result in energy savings. Setting the thermostat back at night and during the day (dual setback) proves over twice as effective as a single setback period. In no instance does thermostat setback increase energy usage.

Computer simulation results using a thermostat setback program agree with results obtained by thermostat setback in actual family residences. This is true regardless of varying house sizes, furnace capacity, lifestyles and occupancy schedules.

Belk, Russell, John Painter, and Richard Semenik 0451
1981 Preferred Solutions to the Energy Crisis as a Function of Causal Attributions.
Journal of Consumer Research, 8, December, 306-312.

Objectives: To test the following two hypotheses: (1) those who attribute a shared problem such as energy shortages to a personal cause, rather than to a nonpersonal cause, are more likely than others to prefer personal actions toward solving the problem; and (2) those who attribute a shared problem such as energy shortages to a nonpersonal cause, rather than to a personal cause, are more likely than others to prefer nonpersonal actions toward solving the problem.

Method: Two studies were conducted to test the responses to the gasoline shortage. The first involved personal interviews with 253 heads of households who travelled at least 140 miles by automobile each month. This study was conducted during the spring and summer of 1979, a period of rapidly escalating gasoline prices. The second study examined attitudes and behaviours with respect to home-heating fuel conservation; it involved interviews with 359 heads of households during the winter of 1980.

Variables: Independent: Study 1 — demographics, media exposure characteristics.
Study 2 — demographics, media exposure characteristics.

Dependent: Study 1 — gasoline consumption, attitudes toward the energy situation.
Study 2 — heating fuel use, attitudes, thermostat setting.

Findings/implications: Both studies support the basic hypothesis that attributions of nonpersonal causes for the energy shortage call for nonpersonal solutions, and that attributions of personal causes call for personal solutions. As clear examples of this, those blaming the general public preferred conservation solutions, whereas those blaming the oil companies preferred government action against these firms. Surprisingly, those who blame OPEC are among the most supportive of mandatory conservation. The most immediate public policy implication, according to the authors, is that the failure of most consumers to see themselves and the general public as the major source of the energy problem is likely to be a substantial deterrent to energy conservation.

0456

Bennett, Peter D., and Noreen Klein Moore
1981 Consumers' Preferences for Alternative Energy Conservation Policies: A Trade-off Analysis.
Journal of Consumer Research, 8, December, 313-321.

Objective: To measure consumers' energy policy preferences with the trade-off method.

Method: A consumer mail panel of 500 males and 500 females was sent questionnaires in July 1978. The final sample consisted of 580 useful responses from 308 females and 272 males. The questionnaire included ten AIO (attitudes, interests and opinions) statements about the energy crisis plus seven energy policy issues. The matrix format procedure for obtaining conjoint measurement data was employed. Respondents were presented with ten sets of two programs each and were then asked to indicate their preference for the policies in each of the ten sets.

Variables: Independent: policy alternatives, AIO statements, severity of each alternative.

Dependent: ratings of the various policy alternatives, energy-related attitudes.

Findings/implications: Attitudes toward the energy situation had changed little between 1974 and 1978 on most items, with the changes that did occur indicating an increased pessimism. The authors conclude that the decompositional methods for measuring consumer preferences appear to hold promise for providing public policymakers with more reliable information than the simpler polling techniques. Also, the authors state that as consumers perceive the energy problem as real and serious they are less likely to strongly oppose harsh, interventionist public policy measures.

0471

Berry, Linda, Jon Soderstrom, Eric Hirst, Bobbie Newan, and Rose Weaver
1981 Review of Evaluations of Utility Home Energy Audit Programs. Springfield, Va.: National Technical Information Service, U.S. Department of Commerce.

Abstract: Evaluation efforts of utilities with active home energy audit programs are reviewed to suggest methodologies, issues and data that can contribute to the development of a comprehensive Residential Conservation Service (RCS) evaluation plan.

About half of the utilities contacted had little or no evaluation activity. Of those with evaluation activity, most conducted only informal evaluations for in-house use. A few utilities had conducted fully documented formal evaluations.

On the basis mainly of written reports received from the utilities, findings about customer response to programs are summarized. The topics discussed include correlates of program penetration rates, use of financing, attitudes toward programs, actions taken, characteristics of participants and energy savings due to programs.

Methodological issues raised by the utility evaluation efforts are discussed. Particular attention is given to three studies (Tennessee Valley Authority, Seattle City Light and Pacific Gas and Electric) that analyze fuel consumption records as part of the evaluation. The potential contributions of these three studies, and of other evaluation efforts, to the design of an RCS evaluation are explained.

0472

Berry, Sandra H., and John D. Winkler
1982 Household Energy Conservation: Strategies for Behavioral Research.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: The work presented in this paper was funded by the Office of Policy, Planning, and Analysis in the U.S. Department of Energy. This contract, dealing with energy consumption and conservation, covers a multiyear study program by Rand of long-term issues important in the formulation of national energy policy. The goals of this program are to help policymakers ascertain: (a) the extent to which the marketplace offers sufficient incentive for the determination of the appropriate level of energy use, and (b) ways in which the government should take action, if at all, to encourage or require further conservation.

Three major questions are being addressed in Subtask 1 of this project. How rapidly are consumers responding to rising energy prices? Are there detectable differences between the behaviour of owner-occupants and tenants? What are the implications of this analysis for public information programs, such as energy-labelling and building and appliance standards?

This paper focuses on the third question, dealing with consumer information. It presents a critical review of research on consumer attitudes toward energy conservation and on behavioural mechanisms that might encourage conservation behaviour. It also describes the potential application of this research in two subject areas: utility report card billing and major conservation purchase decisions such as energy-efficient appliance purchases or household retrofits.

0473

BGI Management Consultants Ltd.
1981 Nova Scotia: Attitudes Towards the Energy Issue, 1980. Prepared for the Department of Mines and Energy, Halifax, N.S.

Objective: To identify the attitudes of Nova Scotian householders toward energy as they prevailed at the end of 1980. The results of this study are compared with those of a similar one conducted in December 1979 and with those of a national survey done in May 1980.

Method: Telephone interviews were conducted with 200 householders in Halifax, Sydney, Yarmouth and Truro. Quota sampling was used in each of the interview centres to reflect an urban/rural dimension and an owner/renter dimension. Names of respondents were drawn at random from telephone directories. The 1979 questionnaire was adjusted and administered to the sample.

Variables: Independent: demographics.

Dependent: various energy-related attitudes and opinions.

Findings/implications: The perceived seriousness of the energy shortage has slipped from third to fourth place over the 1979-80 period, following inflation, unemployment and housing. About 5% of householders regard energy as the most important issue.

Relative to 1979, Nova Scotians show less concern about shortages in heating oil, electricity and gasoline/diesel. However, a greater percentage regard shortages in coal and hardwood as relatively serious.

About 95% of respondents feel that individuals should contribute toward energy conservation, but only about 76% feel that individuals would conserve energy voluntarily in the home, 59% in the use of cars and 56% in recreation.

An increasing percentage of Nova Scotians do not perceive energy conservation as a threat to their economic and social well-being. They are of the opinion that technology, a change in lifestyle or a combination of the two would be required to cope with the energy issue.

Generally, the levels of support for various government policies have not changed much over the 1979-80 period. However, the authors indicate that respondents appear to be somewhat confused in their perceptions of government policy on some energy issues.

0491

Bixby, Ronald, Martin Hass, and Robert MacLagger
1981 Profile of the 1979 Fuel Shortage.
Report no. 193. Albany, N.Y.: New York State Department of Transportation.

Abstract: This is the second of five reports (PRRs 192-196) which present the background data and analysis for the New York State Transportation Energy Contingency Planning Study. One of the basic reference points for the study was the 1979 summer fuel shortage and its impacts on New York State. This report presents a profile of the shortage period in terms of fuel price, availability and travel for different geographic areas.

0492

Bixby, Ronald, Arlee Reno, and Thomas Corsi
1981 New York State Transportation Energy Contingency Planning. Report no. 196. Albany, N.Y.: New York State Department of Transportation.

Abstract: This report presents a summary of the major findings and conclusions of the New York State Transportation Energy Contingency Planning Study. The study has developed information on the impacts of different types and durations of energy emergencies, and the most promising actions and strategies than can be taken to alleviate those impacts. This information is intended to assist ongoing state and local emergency-planning activities conducted by government, transportation providers and private business, as well as to benefit the public in understanding how best to cope with transportation energy emergency situations.

0493

Bixby, Ronald, Arlee Reno, Thomas Corsi, Everett Carter, and Paul Schonfeld

1981 Analysis of the Impacts of Future Fuel Shortage Scenarios. Report no. 194. Albany, N.Y.: New York State Department of Transportation.

Abstract: This is the third of five reports (PRRs 192-196) which present the background data and analysis for the New York State Transportation Energy Contingency Planning Study. In this report, four scenarios for energy emergency planning are defined and their characteristics presented. These include: (1) the current base case distribution of local and intercity auto and truck travel by geographic areas of the state; (2) a mandatory 8% emergency conservation gasoline reduction target imposed on the state; (3) a temporary 11% gasoline shortage similar to the contingency situation experienced during the summer of 1979; and (4) a longer-term 20% shortage precipitated by some international crisis. The base case travel framework is presented along with forecasts of the annual VMT (vehicle miles travelled) reductions by area, trip purpose and time of the week associated with each of the scenarios. The important impacts of the scenarios are discussed, including the effects of fleet fuel-efficiency improvements and the shift from the automobile to other modes.

0494

Bixby, Ronald, Arlee Reno, Thomas Corsi, Everett Carter, Paul Schonfeld, and Martin Hass

1981 Analysis of Actions Appropriate for Transportation Energy Emergencies.
Report no. 195. Albany, N.Y.: New York State Department of Transportation.

Abstract: This is the fourth of five reports (PRRs 192-196) which present the background data and analysis for the New York State Transportation Energy Contingency Planning Study. This report identifies what actions by government and the private sector may be appropriate given the type, magnitude and geographic distribution of the overall responses within New York State to future fuel shortages. It estimates the relative effectiveness of these actions in terms of replacing lost mobility, minimizing economic losses, maintaining public order and assuring equitable distribution of the remaining adverse impacts that will always result from a gasoline shortage. A detailed profile of over 30 actions, including background information, feasibility implications and impacts by scenario, is presented.

0496

Bixby, Ronald, Arlee Reno, Martin Huss, and Robert MacLagger
1981 NYS Transportation Energy Contingency Planning Inventory. Report no. 192. Albany, N.Y.: New York State Department of Transportation.

Abstract: This is the first of five reports (PRRs 192-196) which present the background data and analysis for the New York State Transportation Energy Contingency Planning Study. This report contains the results of the inventory of key transportation and energy-related data, including statewide and local area data on the New York State vehicle fleet, socioeconomic characteristics and transportation fuel use, compiled for use during subsequent analysis. Where possible, the data are disaggregated by standard Metropolitan Statistical Areas and other local units and therefore provide a useful technical tool for local area energy planners.

0497

Blumstein, Carl, Betsy Krieg, Lee Schipper, and Carl York
1980 Overcoming Social and Institutional Barriers to Energy Conservation.
Energy, 5, 4, 190, 355-371.

Abstract: Although they represent economically rational responses to the energy crisis, energy conservation actions may be hindered by social and institutional barriers. The nature of these barriers is explored and a taxonomy of barriers is proposes. Results of a series of interviews provide examples of the different types of barriers. Strategies for overcoming barriers are examined and some criteria for evaluating such strategies are developed. The importance of considering not only the efficiency of strategies in achieving the goal of energy conservation, but also their impacts on other, possibly competing, social and economic goals is emphasized. The need for increased efforts aimed at overcoming barriers, as well as the need for further research into the nature of these barriers, is discussed.

0499

Bockels, Lothar
1982 Sociopolitical Risks of Deficient Energy Supply. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper examines the implications of an energy conservation policy which relies on rising energy prices. It demonstrates the need, in certain circumstances, for the state to provide compensation for the negative external effects of rising prices through social policy decisions. A number of factors are examined which influence the ways in which various groups are affected by continuous price increases. The impact on the economy of West Germany is also discussed. The paper concludes by drawing attention to the need for and the problems surrounding a long-term energy strategy.

0506

Boscamp, Robert L., and Bruce J. Walker
1979 Marketing and Technical Considerations for a Residential Energy Audit Program.
In Proceedings of the 1979 National Conference on Technology for Energy Conservation. Silver Spring, Md.: Information Transfer, Inc., 169-173.

Abstract: The purpose of this paper is twofold: first, to discuss key marketing and technical hurdles associated with successfully implementing an effective residential energy audit program; and second, to briefly profile an operational energy audit system, the Enercom Audit System, which has been implemented in diverse areas across the United States. A number of key marketing issues are discussed in relation to an audit program, including the identification of consumer needs, the selection of target markets and the development of an appropriate marketing mix. Technical considerations addressed in this paper include the importance of clearly defined design parameters, such as the objectives and scope of an audit program, methods of data assembly and computation, the use of computers for data computation and storage, and the nature and timing of follow-up reports. The Enercom Audit System and its two basic versions (a do-it-yourself audit and an audit by a trained technician) are described.

0507

Boyle, Daniel K.
1981 Transit Use and Gasoline Shortages.
Report no. 200. Albany, N.Y.: New York State Department of Transportation.

Abstract: This report uses a representative sample of 66 urbanized areas to examine the relationship between gasoline supply and transit ridership during the second and third quarters of 1979. An overview of the effect of the 1979 gasoline shortfall on transit ridership indicates that ridership increased by 5.1% in the time frame of the study over the same period in 1978. Largest percentage increases in ridership were seen in western urbanized areas and small urbanized areas. Cross elasticities of transit ridership with respect to gasoline supply are calculated for various categories broken down by region and system size. The measure used for these calculations is arc elasticity. The cross elasticities varied from -0.45 for large systems in the Northeast to -4.99 for small systems in the West, with a cross elasticity for the entire sample of -0.75.

The role of transit in alleviating the impact of the 1979 energy crisis is found to be minor: gasoline savings due to transit patronage increases amounted to less than 5% of the decrease in gasoline sales, although transit played a more significant role in a few urbanized areas. Factors are developed which can be applied to forecasts of transit ridership to adjust for the effect of future gasoline shortfalls. With the use of this factor, ridership increases and gasoline savings attributable to transit in future energy crises can be calculated. For each category, typical percentage ridership increases and gasoline savings are estimated for a variety of energy futures. Transit cannot be expected to play a major role in an energy emergency. Further research is indicated in quantifying the effects of transit system capacity in a crisis situation.

0516

Brog, Werner, Peter Iblher, and Barbara Mettler-Meibom
1982 Energy Consumption in Private Households: Use of Individual Oriented Behavioral Models to Explain and Forecast Consumer Behavior.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper deals with contextual and conceptual methodological topics. It is based on basic research on the potential and limits of energy conservation in private German households conducted by the institute SOCIALDATA on behalf of the Federal Ministry for Research and Technology during 1980-81.

The paper describes a modelling approach that was used in this study, an approach which takes the objective as well as the subjective parameters of individual behaviour into consideration. It seems to be important to account for individual behaviour if one is to forecast the options open to the consumer to conserve energy by either using less energy or by investing in energy-saving devices.

This is the first attempt to use a relatively current modelling approach of this type in the area of energy research. This approach has already been frequently used in the area of transportation research.

0814

California Energy Commission
1982 The Measurement and Evaluation of the Energy Conservation Potential in California's Residential Sector.
Staff report, Conservation Division, California Energy Commission, July 1982.

Abstract: This document evaluates the energy and dollar savings of a variety of major conservation measures and practices in California's residential sector. These savings are analyzed from both the individual and the aggregate points of view, although this present preliminary document reports only on household-level data, promising the aggregate at a future time. In terms of California's current residential sector energy consumption, space and water heating dominate, accounting for 54% of total sector energy use. The main fuel source for residential space and water heating is natural gas. The housing stock and appliance saturation are described as well as measures and practices for reducing energy consumption in residential space heating/cooling and water heating. The document then provides a detailed examination of the energy conservation potential at the individual household level in California. The focus of this examination is on hot water, space heating and space cooling. Finally, the document concludes with an economic analysis of the cost-effectiveness of the various energy conservation measures.

0819

Canadian Facts
1981 Fuel Consumption Label Survey.
Prepared for the Road and Motor Vehicle Traffic Safety Branch on behalf of Transport Canada.

Objectives: (1) To determine the level of cooperation shown by manufacturers and dealers in relation to Transport Canada's suggestion that fuel consumption labels be provided for 1981 car models; (2) to assess dealer attitudes toward the program and public interest in fuel consumption as perceived by the dealer; and (3) to assess the availability of the "Fuel Consumption Guide" and/or other methods of presenting fuel-economy information to the consumer.

Method: A national sample of new car dealers (N = 537) was selected to ensure that the sample size for each province was proportionate to the total number of dealerships. The sample allocation within each province was proportionate to the number of dealerships by type (domestic and foreign) and community size. Personal interviews were conducted with sales managers of selected dealerships during April and May 1981. Interviews were conducted with 95% of the total sample.

Variables: Independent: type of dealership, community size.

Dependent: attitudes toward fuel consumption labels, behaviour which indicates support or lack of support for the program.

Findings/implications: Dealers' estimates indicate that 51% of the vehicle-size groups produced by manufacturers are fully labelled. Foreign manufacturers are less likely to cooperate than their domestic counterparts.

Evidently, the majority of dealers are not prepared to assume the manufacturers' responsibility for attaching fuel consumption labels to passenger cars. The labels are considered unattractive and some dealers remove them during cleanup.

Most dealers report receiving inquiries from customers about fuel consumption rates. Seventy-five per cent of the dealers support continuation of the labelling program; however, they recommend changes to improve customer comprehension of the metric units used on the labels and to provide more realistic figures.

Canadian Facts (cont.)

About one-half (52%) of the dealerships visited had copies of the "Fuel Consumption Guide, 1981" available to customers in showrooms. Nearly all dealerships claimed to have received it. The level of support for continuation of the guide was high (90% of dealers).

One-third of the 1981 passenger cars observed on lots had labels containing fuel consumption figures. The proportions for domestic and foreign vehicles were 36% and 21%, respectively.

0821

Canadian Government, Office of Tourism
1980 Energy and Tourism: The Evolving Situation and Some Implications.
Ottawa: Office of Tourism, Canadian Government.

Abstract: This report focuses on energy issues as they relate to tourism at the national level. Some regional issues which emerge are also discussed. Different energy scenarios are analyzed to help the tourism industry and governments in contingency planning.

Canada's uncertain energy environment means that the tourism industry must maintain a high degree of information and coordination. The industry's business plans and government development plans must take into account the necessity for locating new tourism plants near major population centres with easy access to multiple modes of transportation. The tourism industry can no longer depend blindly upon growth in automobile or air travel. Consideration must be given to the possibility that mass surface modes may become increasingly important and may, in crisis situations, provide the only alternative for continued tourism demand. Several government initiatives which may be necessitated by energy supply/price changes are discussed.

0824

Canfield, Monte Jr., and Adam E. Sieminski
1975 If You're So Smart, Why Ain't You Rich?
Public Administration Review, July/August, 322-327.

Abstract: This article attempts to describe the energy predicament in which the United States found itself, analyzes the major barriers to energy conservation and provides some suggestions on how best to arrive at rational energy conservation policies. The energy problem, quite simply, involves the high-energy lifestyle of the United States plus the decreasing productivity of conventional domestic energy supply systems. Three main targets for energy conservation are discussed: transportation, buildings and industrial plants. The authors, admitting that the targets are obvious, discuss the barriers to conservation in these areas, and conclude that the barriers are much less technological in nature than social, political, economic and institutional. One of the main problems is an over-reliance on the price mechanism alone. The multiple goals facing policymakers in the real world preclude an easy solution. The authors advocate either rationing or tax increases as a short-term step towards solving gasoline consumption problems, whereas the longer-term solution must focus on the automobile stock. With respect to the housing stock and space heating the authors argue that the "rules of the game" will have to be altered through public policy procedures to make it more rational to build energy-efficient homes. The opportunities for energy conservation in the industrial sector are immense. Once again, government assistance will undoubtedly be necessary to realize this potential. The authors conclude by acknowledging the overwhelming importance of a rational pricing policy for energy but at the same time indicate that the ultimate approach involves a policy mix which will not be easy or simply determined.

0866

Chung, Jae Wan
1981 The Price of Gasoline, the Oil Crisis, and the Choice of Transportation Mode.
Quarterly Review of Economics and Business, 21, 3, 77-86.

Abstract: This paper estimates the elasticities of substitution between user-operated and purchased transportation modes in response to both changes in relative transportation cost and to changes in gasoline prices for U.S. urban and intercity areas combined and for U.S. urban areas alone, with and without time lags. These estimates are compared to sample periods both before and after the 1973-74 oil crisis.

The principal conclusions are as follows. (1) While the elasticity of substitution covering urban and intercity areas combined is generally high, the elasticity of substitution for urban areas only is substantially lower, implying that the household sector in urban areas has much less propensity to substitute purchased for user-operated transportation. (2) The elasticity of substitution with respect to changes in gasoline prices is not very high in both the logged and unlogged versions of the model for the two areas. Therefore, it must be concluded that although the 1973-74 oil crisis affected the household's choice of transportation mode, the impact was not as significant as expected. The results suggest that user-operated transportation is a luxury only to a marginal degree, emphasizing the need for a strong gasoline pricing policy, reinforced by other policy measures. (3) The effects of higher transportation costs, specifically gasoline costs, on modal choice occur immediately in both areas and last for several years, with a gradually declining pattern in urban areas. This result implies that the response conditioned by previous cost increases and, hence, by expectations about future cost changes, induces the household sector to make adjustments continuously over time.

The methodological limitations of the analysis are discussed and suggestions are made for further research.

0878

Claxton, John D., and Paul N. Cooke
1982 Alternative Energy Study.
Prepared for Puget Sound Power & Light Company, Bellevue, Wash.

Objectives: (1) To identify wood-device penetrations and use patterns among single-family households in the Puget Power service area; (2) to identify how adopters of various wood devices, such as fireplaces, inserts and stoves, differ in terms of demographics, house and appliance characteristics, conservation actions, and energy and wood-use attitudes; and (3) to provide a better understanding of the circumstances that lead households to make particular wood-burning device adoption decisions.

Method: A two-stage preliminary process, involving a review of the energy conservation and wood adoption literature and focus group interviews with Puget Sound customers, was used to develop a telephone questionnaire, which was administered in December 1981 (N = 568).

Variables: Dwelling characteristics, demographics, appliance ownership, conservation actions, various energy-related attitudes and wood-burning device saturations.

Findings/implications: Among the major findings:

(1) 22.1% of residents do not have any form of wood burning device in their homes. The remaining residents (77.9%) had wood stoves (21.3%), inserts (14.9%) and fireplaces (41.7%).

(2) Wood-device saturations differ significantly by company division. These differences appear to be traceable to significant housing structure and household demographic differences that exist between divisions.

(3) Exploratory regression models are used to identify a number of factors that may have affected wood-device adoption in the service area. These factors are discussed with reference to houses with and without fireplaces.

(4) Wood-use behaviours reveal that 59% of households cut their entire wood requirements themselves, largely from their own or friends' woodlots. Only 34% of wood users purchase any wood. The average distance respondents report travelling one-way to collect wood is 12.8 miles.

Claxton, John D., and Paul N. Cooke (cont.)

(5) Factor analyses of energy and wood-use attitudes suggest that energy views can be structured in terms of economic constraints, conservation knowledge, perceptions of personal responsibility to conserve, and beliefs about the future availability of energy sources. Wood-use attitudes appear to be formed along the dimensions of economy and convenience.

(6) Finally, decisions to adopt wood stoves and insulation have similar patterns of spouse involvement, with both measures seen as primarily male areas of expertise.

0879

Coen, Anna, and Antonio Sillitti
1982 Social Multiplier Effect and Energy Policy for Post-Industrial Societies.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: In the past, energy consumption was related to economic growth, with a strong correlation between a country's GNP and energy use (elasticity). By the end of the 1970s, following a trend toward dissociation, it was recognized that the link between economic growth and energy use in overall terms should not be assigned too much importance.

For the long-term definition of an energy policy, a strategical planning approach is suggested, that is, a type of planning which anticipates the ongoing trends of societal change through the mechanisms of the social multiplier effect. The use of social indicators may permit strategical planning based not only on technical and economic factors, but also on new, less tangible factors accruing within our changing societies. The use of social indicators seems to be well adapted to the energy situation, since future consumption may be influenced by structural changes. Such indicators, however, should also be used in the strategical planning of other resources.

0893

Cook, Stuart W., and Joy L. Berrenberg
1981 Approaches to Encouraging Conservation Behavior: A Review and Conceptual Framework.
Journal of Social Issues, 37, 2, 73-107.

Abstract: This paper introduces a conceptual framework aimed at integrating the conservation behaviour literature and facilitating the comparison of findings across studies. Within this framework, conservation behaviour is approached from the theoretical orientations of attitude change, behaviour modification and behaviour maintenance. Seven commonly used approaches to encouraging conservation behaviour are described in terms of these perspectives. Illustrative research related to each approach is reviewed.

0896

Cooper, Mark, and Theodore L. Sullivan
1982 The Role of Consumer Assurance in the Adoption of Solar Technologies.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper examines the role that consumer assurance mechanisms can play in fostering the adoption of solar technologies in the residential housing market. It begins by establishing a definitional scheme of consumer assurance and the general role that consumer assurance plays in the market. Such a set of definitions is necessarily arbitrary, but it is realistic and well suited for empirical analysis. After the definitions and basic concepts are set down, the evidence on general conditions in the building market is reviewed, and it is demonstrated, using the same analytic framework, that these conditions can make consumer assurance particularly important to the adoption and spread of solar technologies. Finally, the available evidence on consumer and producer behaviour in the market is reviewed to show that the conceptually defined needs for consumer assurance are, indeed, present in the marketplace.

0949

Crossley, David J.

1982 Barriers to Household Energy Conservation.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To identify barriers to energy conservation by individual householders which inhibit or retard changes in current inefficient patterns of energy use.

Method: The focus was specifically on nontechnical barriers, that is, social, institutional and economic factors which prevent people from increasing the efficiency with which they use energy. Barriers were identified by content analysis of interviews with Melbourne householders (N = 47). These barriers were therefore those which were seen as being important from the perspective of the householders.

Variables: Demographic and socioeconomic measures, dwelling characteristics, reactions to various energy conservation practices.

Findings/implications: Six categories of barriers were identified on the basis of the circumstances out of which the barriers arose. These were barriers arising out of personal predisposition, living situation, economic costs, social costs, inadequate information and structural factors. Distributed among these 6 categories were 25 different types of barriers. Energy policymakers should examine in detail barriers to energy conservation similar in nature to those identified in this paper, and then develop appropriate policy mechanisms to overcome these barriers.

0961

Crossley, David J.
1980 Congress Symposium: Energy, People and the Environment. Presented at the Jubilee Anzaas Congress, Adelaide, May 2-16, 1980.

Abstract: Until recently, the likely sociopolitical consequences of energy policy initiatives were not considered before policy decisions were taken. Attempts to change approaches to energy policy formulation so that more attention is given to sociopolitical factors depend on techniques which have been developed for identifying and measuring social costs and impacts of energy systems. Despite formidable methodological problems, much work is now being carried out in this area, and it should be possible to use the results of this work to forecast likely sociopolitical consequences of proposed energy policy initiatives. Barriers to consideration of sociopolitical consequences during energy policy formulation can be overcome by increasing the information available on sociopolitical consequences of energy policy decisions, facilitating public participation in energy policy formulation, and improving the institutional arrangements and procedures for formulating energy policy.

0966

Crossley, David J.
1979 Energy Policy and People.
In M. Diesendorf, ed., Energy and People. Canberra: Society for Social Responsibility in Science (ACT), 76-84.

__Abstract__: Most Western postindustrial societies define energy policy in terms of supply and demand problems. Such an approach fails to recognize the interrelationships between energy and all social processes. Arguing that energy policy decisions ultimately affect the basic structure of human society and hence people's lives, the author emphasizes the importance of considering moral and political aspects of energy policy. Moral questions arise when energy policy initiatives can be seen to have definite social implications which affect people's lives; the questions are concerned with the justification for choosing one policy option over several others. Political questions arise out of the actual decision-making process by which a particular policy option is chosen. These questions are concerned with who actually makes the decision, on what information and advice, the procedures and channels available for this decision to be reviewed, and who actually carries out this review. Energy policy formulation in Australia is described to illustrate the failure of government energy policy to consider and account for the social consequences of such decision making.

1208

Darley, John M.
1977 Energy Conservation Techniques as Innovations, and Their Diffusion.
Energy and Buildings, 1 (1977-78), 339-343.

Abstract: This paper melds the findings of the Twin Rivers, N.J., studies with the seminal works of Rogers on diffusion of innovation. Rather than taking a more traditional approach to energy conservation technology, the author examines the conditions under which energy conservation procedures and techniques are most likely to be adopted voluntarily. He concludes that economic incentives are insufficient to ensure the adoption of energy-conserving techniques and that a psychologically based theory of the diffusion of innovation will provide a much clearer understanding of the variables necessary for promoting energy-conserving products and techniques. The author suggests that a diffusion theory for energy innovation should include the following initial parameters. (1) Only a subset of the target population initially will feel the need for the particular innovation in question. (2) Individuals must perceive that they are in a negative state but one that is remedial. (3) Individuals must perceive that a specific, durable, usable innovation is available that will noticeably impact on their problems. (4) The innovation must work, and must be perceived as working, effectively.

1209

Darley, John M., and James R. Beniger
1981 Diffusion of Energy-Conserving Innovations.
Journal of Social Issues, 37, 2, 150-171.

Abstract: The authors suggest that people's decisions to adopt energy-conservng processes and products constitute a specific instance of the decision to adopt an innovation. Drawing on previous research, eight dimensions are postulated by which energy-conserving innovations are evaluated. It is argued that people's perceptions of an innovation's characteristics on these dimensions determine their decisions to adopt the innovation. Congruent with past research, the authors suggest that information that determines people's perceptions of innovations is more likely to be transmitted via social networks than mass media or other channels of communication. Taken together, these propositions form a theory of the adoption and diffusion of energy-conserving innovations.

Research is required to test the theory, and to this end the authors make several design suggestions.

1214

de Boer, A.A., and P.F. Sens
1982 The Influence of the Public on the Introduction of Solar and Wind Power.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper discusses the impact of consumer attitudes on the introduction of solar energy and wind power. The analysis is based partly on the authors' experience in national research programs for solar and wind energy and partly on a study of institutional bottlenecks hampering the introduction of solar energy in the Netherlands. Among the major conclusions are the following. (1) A positive attitude on the part of consumers toward immature solar installations should not mask the need to develop installations which meet the highest standards of reliability, maintainability and comfort. (2) The consumer requires a system which is foolproof in order to confirm his or her idea that something which is modern is better and more comfortable than something which is conventional. (3) Wind-turbine or solar systems must be developed which are acceptable from the point of view of cost. (4) In the field of policymaking, political polarization represents an underestimated danger to the harmonious development of new energy sources.

1216

de Boer, Joop, Peter Ester, Carol Mindell, and Marcel Schopman
1982 Consumer Energy Conservation Programs in the Netherlands. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper presents an overview and analysis of consumer energy conservation programs in the Netherlands. The study is part of a multinational research project entitled Consumer Energy Conservation Policies which is being conducted in six countries: the Federal Republic of Germany, the United Kingdom, Sweden, Greece, the United States and the Netherlands.

Energy conservation programs are analyzed in terms of target groups, program objectives, program instruments, program impacts and cost-effectiveness and against the background of the Dutch energy situation and energy (conservation) policy.

The paper ends with a number of evaluative conclusions and policy recommendations.

1221

Den Boon, A.K.
1982 Car Use and Attitudes Towards Cars and Pollution. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To compare the attitudes of car drivers and nondrivers toward car use. Perceived advantages and disadvantages to individuals and to the public are examined.

Method: A stratified sample (N = 1,114) of car buyers and nonbuyers was drawn from Amsterdam and three neighbourhood commuter towns. A closed-end questionnaire was administered.

Variables: Various sociodemographic and situational variables, measures of environmental perceptions, level of car use, and various attitudes toward car use and its effects on the environment.

Findings/implications: Although environmentalists drive substantially less than nonenvironmentalists, these differences appear to be caused primarily by situational variables. The findings also indicate that differences between drivers and nondrivers can only be found in attitudes related to individual advantages and disadvantages. Finally, whether or not they have a car substantially affects environmentalists' attitudes toward the desirability of restrictive measures for cars in their neighbourhood. Implications for policymaking are discussed.

1222

Denney, Wm. Michael, George R. Heaton, Jr., and Judith I. Katz
1978 The Impact of Advertising, Marketing and Other Market Information on Consumer Energy Use: A Workshop Report. Center for Policy Alternatives, Massachusetts Institute of Technology.

Abstract: This document reports on a workshop concerning the relationship between various kinds of market information and consumer energy conservation. The issue of energy conservation was approached from economic, political, resource depletion and moral perspectives. It was agreed that the consumer sector must play a major role in conservation, and further that it would be a mistake to "sell" conservation as sacrifice or as necessary to avert a major catastrophe. There was disagreement, however, on whether energy conservation goals could be achieved without substantial long-term lifestyle changes. Consumer information is perceived as an integral part of any energy policy, as consumers currently lack sufficient motivation to conserve and sufficient knowledge to act even if the motivation did exist. It was agreed that currently existing information was inadequate. Consensus was reached that the government had an essential role to play in the dissemination of conservation information. Energy conservation was seen as having been poorly marketed to date.

1223

Department of Industry and Energy (Dublin)
1981 Saving Energy Saves You Money.
Dublin: Department of Industry and Energy.

Objective: To assess the effectiveness of two mass media advertising campaigns in encouraging energy conservation in the residential sector.

Method: In September-October 1980, and again in February 1981, householders were urged to insulate attics, fit lagging jackets on hot water cylinders and weather-strip doors and windows. In October 1980, an attic insulation grant scheme was implemented.

In May 1981, a representative net sample of 1,000 householders were interviewed.

Variables: Independent: socioeconomic and demographic variables, household characteristics, awareness of campaign.

Dependent: conservation action.

Findings/implications: The results of the survey indicate that 77% of those interviewed were aware of the campaign and 50% were aware of the insulation grant. Over 60% of the sample reported taking some conservation actions since the campaign was introduced — most involved no- or low-cost behaviour such as switching off unwanted lights and turning down thermostats. Positive correlations were found between social class and the installation of lagging jackets and between urban households and the installation of lagging jackets. The greater the number of residents per household, the more likely that some conservation steps had been taken.

1224

Dholakia, Ruby R., Nikhilish Dholakia, and A. Fuat Firat
1982 From Social Psychology to Political Economy: A Model of Energy Use Behavior.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: Multiple and complex factors determine people's energy-use behaviour. Policies designed to affect individual energy-use behaviour, however, focus mostly on a limited number of micro, short-run and easily manipulable variables. These policies have had limited success.

A theoretical framework is proposed in this paper that attempts to provide a comprehensive and integrative view of energy-use behaviour. It examines variables that create and maintain particular types and intensities of energy-use behaviour. Based on this framework, implications for energy policies and their potential effectiveness have been drawn.

1227

Dietz, Thomas, et al.
1982 Residential Energy Conservation Policy: An Overview of the Davis, California, USA Experience.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper summarizes a series of studies on residential energy conservation policy conducted in Davis, California. Davis, one of the first cities in the United States to adopt policies designed to reduce residential energy consumption, provides researchers with a natural laboratory. While caution must be used in generalizing the findings, some of the conclusions warrant further consideration.

(1) In implementing conservation, it seems important to develop policies that are attuned to the local situation and are comprehensible to the people who must deal with them.

(2) Social and psychological incentives for energy conservation seem to be very important.

(3) One implication for research policy relates to the importance of multi- and interdisciplinary research efforts. Residential energy consumption is a human activity which cannot be wholly understood within the framework of a single discipline.

1228

Dillman, Don A., Eugene A. Rosa, and Joyce J. Dillman
1982 Lifestyle and Home Energy Conservation in the United States: The Poor Accept Lifestyle Cutbacks While the Rich Invest in Conservation.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To examine the extent to which U.S. consumers have taken lifestyle cutbacks in 11 expenditure areas as a result of higher energy prices.

Method: Data are from a general population sample survey of 8,392 households in ten western states, covering approximately 24% of all U.S. households.

Variables: Demographics, home conservation actions and adjustments, lifestyle cutbacks.

Findings/implications: It was found that an index summarizing the extent to which respondents had taken lifestyle cutbacks was somewhat related in a positive direction to making temporary home adjustments to save energy, but was not related to taking permanent home-related energy conservation actions. The data do not support the hypothesis that being forced to take lifestyle cutbacks in response to higher energy costs increases the likelihood of taking conservation actions. This finding brings into question the market approach of stimulating energy conservation through higher energy prices. At the same time, the findings raise disturbing questions about existing tax-credit programs.

An examination of the relationship between family financial resources and each of the indexes indicates that lifestyle cutbacks are reactions of predominantly lower-income people who, in general, lack savings. Conservation actions, on the other hand, are the reactions of people who have higher incomes and/or invested money that can be used for that purpose. In short, the poor have tended to take cutbacks, while the rich have tended to invest in conservation in response to higher energy prices.

1231

Dillman, D.A., P.A. Tripple, C.J. Makela, J.J. Dillman, and L.B. Chatelain

1981 A Western States Perspective on Public Policy for Household Energy Conservation.
Housing and Society, 8, 2, 80-92.

Objective: To contribute to an understanding of differences among western states in the United States, in an effort to inform state policymakers in their continuing attempts to deal with energy conservation issues.

Method: The analysis is based upon 9,702 completed mail questionnaires from household samples of the general public in each of 11 states. In all the states except Pennsylvania, the samples were drawn from telephone directories using random procedures. In Pennsylvania, the sample was drawn from state drivers licence lists.

Variables: Major variables include attitudinal measures and measures of home conservation behaviour.

Findings/implications: The attitudes of residents of the western United States seem consistent with the emerging direction of U.S. energy policy. The renewed emphasis on production, coupled with continued, albeit somewhat less, emphasis on conservation, is supported by people's attitudes.

If a conservation policy is pursued, the most favoured target for energy-use reduction is the home as opposed to private transportation or the production sectors of the economy. Consideration of home-related conservation choices reveals substantial support for existing laws implemented by the federal government during the past several years. It is equally clear, however, that more specific regulations, such as required regulation of home temperatures, rationing of home heating and cooling, and mandatory home energy audits, are not favoured. At the same time, the results indicate that people believe it is possible for them personally to reduce their energy consumption should it be necessary to do so.

Dorfman, Nancy S. 1233
1981 Gasoline Distribution Policies in a Shortage: Welfare Impacts on Rich and Poor.
Public Policy, 29, 4, 473-505.

Abstract: The major policy alternatives for bringing gasoline demand into balance with supply if the flow is interrupted in an emergency are compared in terms of their effects on the aggregate loss in social welfare and the proportion of low-income households that will suffer losses. Allowing the price to clear the market is shown to minimize the total loss in consumer and producer surplus, but can present serious distributional problems. It is concluded that a choice between efficiency and equity can be avoided, however, by taxing the price increase and redistributing the proceeds to vehicle owners. Low-income households will be better off under such an allocation system than under any of the leading alternatives. Using a simple analytic model and data from the 1977-78 National Personal Transportation Study on the distribution of gasoline consumption within income groups, it is estimated that such a surtax would be likely to improve the lot of over 90% of households in the lowest 30% of the income distribution, compared with their having to queue for gasoline under price controls. The conventional wisdom that queuing is preferable for the poor because of the low value they place on their time is contradicted. Upper-income households will fare even better than those with low incomes.

1236

Dunlap, Riley E., J. Keith Grieneeks, and Milton Rokeach
1983 Human Values and Pro-Environmental Behavior.
In W. David Conn, ed., Energy and Material Resources: Attitudes, Values and Public Policy. AAAS Selected Symposium 75, Boulder, Colo.: Westview Press, 145-168.

Objective: To test the hypothesis that individuals motivated by Maslow's "higher order" values are especially likely to engage in proenvironmental behaviour such as recycling.

Method: A sample of recyclers (N = 94) was obtained from patrons of two Pacific Northwest recycling centres (newspapers and bottles). Value data collected in 1971 were also obtained for a national sample of adult Americans.

Variables: Demographic and socioeconomic measures, value rankings (Rokeach Value Survey).

Findings/implications: Compared to a national sample, the recyclers are found to emphasize higher-order values such as aesthetics and self-actualization, and to deemphasize lower-order values such as safety and security. While the differences are reduced somewhat when the recyclers are compared to a matched subsample with similar demographic characteristics, the basic pattern of differences remains. The potential theoretical and policy implications of the results are briefly discussed.

Edelson, Edward, and Marvin Olsen 1609
1982 Community Leaders' Perceptions of the Impacts of Energy Conservation Measures.
In Frederick A. Rossini, Alan L. Porter, and C.P. Wolf, eds., Integrated Impact Assessment. New York: North-Holland, forthcoming.

Objective: To assess the potential social, institutional and environmental impacts of several energy conservation measures that are being considered by federal, state and local energy officials on two types of communities: a large industrial urban area and a smaller agricultural-based urban area.

Method: Personal unstructured interviews with community leaders in Seattle (N = 27) and Yakima (N = 24), Washington, were used to collect data for this research.

Variables: Attitudes and beliefs about the ways in which five different energy conservation measures will impact upon facets of the environment, the economy, the community, the individual and the quality of life.

Findings/implications: Two broad conclusions emerged from this research.

(1) Energy conservation, whether it is implemented through the five measures examined here or in other ways, will basically be beneficial for the natural environment and society. The process of implementing and adjusting to these various conservation measures will create numerous problems and tensions, but they will be manageable. As conservation practices and values become increasingly interwoven in society, numerous beneficial consequences of reduced energy consumption will be experienced.

This overall positive assessment of the probable impacts of energy conservation becomes especially attractive when contrasted with the wide array of harmful environmental and social impacts that would result from the alternative policy of continuing to expand energy production using coal or nuclear energy.

(2) If and when energy conservation, again in all its various measures, becomes a dominant thrust in society, it will stimulate and reinforce a broader process of social change throughout society. Energy conservation will be much more than just a new set of technologies to be grafted onto existing social patterns. It will be an

Edelson, Edward, and Marvin Olsen (cont.)

integral part of a whole new way of life and a new set of cultural values. These new patterns may encompass family life, educational activities, work roles, consumption practices, recreational activities, community organization, the economic system, politics and government.

Egel, Kenneth S. 1621

1982 Energy Cost Control in Nonprofit Multifamily Housing. Evaluation Review, 6, 6, 811-826.

Abstract: During 1981, Berkeley Planning Associates designed and field-tested a model for comprehensive energy management in nonprofit student, elderly and government-assisted multifamily housing. The model was tested using the University Students' Cooperative Association of Berkeley, California, the largest nonprofit student housing cooperative in North America. The program included extensive energy auditing and postconsumption data analyses, conservation workshops and seminars for residents, modification of energy-billing systems, and the installation of energy-saving equipment in the test buildings. Overall energy use in the test buildings was reduced by 24.1% as compared to a 0.0% change in consumption in the control building sample. Projected annual dollar savings for the test buildings totalled $36,750. The simple payback period for energy-saving equipment installed in the test buildings (excluding labour) was 1.3 months. The article examines the model and discusses the factors most responsible for the program's success.

1622

Eichen, Marc, and George Tukel
1982 Energy Use and Conservation in the Residential Sector: Methodological Questions and Policy Prescriptions. Energy Policy, 10, 1, 49-56.

Abstract: This article summarizes the state of the art in public surveys which gather and analyze information regarding U.S. residential energy demand and consumption patterns at the micro (household) level. Five studies representing a range of approaches to gathering information on energy consumption and end-use patterns at the individual or family level are compared in terms of sample design and methodology, audit/interview content, level of data analysis and policy prescriptions. The authors conclude with a number of suggestions for further research at the micro level.

Electric Power Research Institute 1629

1981 Customer Acceptance of Direct Load Controls: Residential Water Heating and Air Conditioning.
EPRI EA-2152 (Project 1429-1). Prepared by Thomas A. Heberlein and Associates, Lodi, Wis.

Abstract: This report analyzes 38 utility-sponsored water-heating load control programs, 16 air conditioning programs and 5 attitude surveys of residential customers who have no experience with load control. This information indicates that, in general, the public has favourable attitudes toward load control. Over 90% participation in voluntary water-heating load control has been achieved by some utilities. Direct personal appeals which provide customers with information appear to be the most effective way to increase participation. Direct incentives to customers are helpful, but the size of the incentive has little effect on participation rates. Up to four hours of water heater shutoffs appear to have little effect on hot water availability for most customers. Some utilities have much longer shutoff periods with 80-gallon water heaters. Those customers who have actually had their appliances controlled continue to have favourable attitudes. It appears possible that 50%-75% of residential central air conditioning customers will sign up for a voluntary load control program, under the right conditions. Marketing again is the key. Off cycles of 25%, 7½ minutes off and 22½ minutes on, appear to have little impact on customers where they have been tried. Longer off cycles seem to be possible under milder climatic conditions.

1637

Ellison, Robert A., Margaret Ellison, and Glenda E. Everette
1983 Enercan: Longitudinal Research Utilizing Aizen's and Fishbein's Theory of Reasoned Action.
In J.D. Forbes, ed., 1983 Marketing Proceedings of ASAC Meetings. Administrative Sciences Association of Canada.

Objective: In view of the Canadian federal government's goal of oil self-sufficiency by 1990, and its intention to make natural gas available to Maritime consumers by 1987, at the earliest, a knowledge of consumer acceptance of current energy alternation and intentions to convert, particularly to natural gas, is essential for policymakers if they are to make relevant policy decisions. The objective of the paper is to report on research that has been initiated.

Method: A longitudinal research design involving several phases is used: pretest of instrument (1982), Pilot study (1982), Field Study Phase I (1983) and Field Study Phase II (1985).

The results presented in this paper are based on primary data obtained in the pilot study. A self-administered questionnaire was administered to a regional sample of Halifax households (N = 140).

Variables: Household characteristics and energy consumption; beliefs, attitudes and intentions related to energy alternatives; demographic and psychosocial information.

Findings/implications: Further explorations of the consumer/natural gas relationship is required. This limited sample did suggest that there is a lack of familiarity with natural gas and a limited belief in the benefit of using natural gas. Influences that can be expected to encourage conversion to natural gas include government subsidies and government-sponsored information, as government was seen to be the strongest source of motivation to comply.

Intention to convert at this time was a negative one and has become the baseline upon which to compare any further declaration of intention by the sample.

Methodologically it was possible, through applications of the theory of reasoned action, to isolate determinants of behaviour systematically. Both social and personal influences on attitudes were examined, as were behavioural and normative beliefs. These can now be considered in conjunction with selected external variables.

Ellison, Robert A., Margaret Ellison, and Glenda E. Everette (cont.)

With the impending advent of natural gas in the Maritime market — a market without a tradition of natural gas usage — policymakers must take into account the barrier of negative attitudes.

1639

Engberg, Lila, and Louise Heslop
1981 An Ecosystem Model for Examining Energy Use by Rural Families.
Presented at the Annual Conference of the Rural Sociological Society, University of Guelph, August 20, 1981.

Objectives: To explain the family ecosystem framework and to identify the categories of variables to consider in examining variations in household energy consumption. It is suggested that the family as a unit has internal and external tasks to perform in order to satisfy perceived needs, that the family consumes energy in the process of meeting needs, and that levels of energy consumption are influenced by the environment and the way the tasks are managed.

Method: In the spring of 1980, a study of household energy consumption, family adjustments and life satisfaction was undertaken in cooperation with the Rural Development Outreach Project (RDOP) of the University of Guelph. Data are based on self-administered questionnaires completed by 103 respondents. A family ecosystem framework was used.

Variables: Factor analysis was used to attempt to identify the sets of measures that were assumed to represent family environmental and task performance variables. Five clear factor configurations emerged: inputs from the technological environment, family integrative actions, adoptive actions, external involvement and perceptions.

Dependent: measures of personal life satisfaction and energy consumption, independent responses of husbands and wives.

Findings/implications: The use of the input/output model of the family ecosystem framework has advantages in that it is possible to identify inputs from various environments that influence family functions. However, the development of appropriate measures is difficult and unwieldy. Interrelationships of variables are complex. Much more work is required in the formulation and testing of measures. In exploring the use of a new framework, it would be an advantage to control for extraneous variation, such as stage in the family lifecycle and occupation of head of household, while testing the influence of family environment and capacities to change.

Ester, Peter, and Richard A. Winett 1647
1982 Toward More Effective Antecedent Strategies for Environmental Programs.
Journal of Environmental Systems, 11, 3, 1981-82, 201-222.

Abstract: The authors review 41 studies and conclude that antecedent strategies can be effective when factors such as specificity, proximity, convenience of the behaviour and salience are addressed. These strategies, however, are still not as effective as consequence strategies. An equally important conclusion to be drawn from the review is that antecedent strategies such as prompts and information are quite often more poorly designed than consequence strategies such as feedback and rebates. From a policy perspective, it is imperative that more effective antecedent strategies be designed because they are generally less expensive than consequence strategies. Concepts from the literature on communications and social diffusion are posited as useful starting points for making antecedent strategies more effective.

2006

Feick, Lawrence F., and Dan E. Moore
1981 Patterns of Household Energy Conservation Behavior: A Cluster Analysis.
Presented at the Meetings of the American Council on Consumer Interests, April 1981, Minneapolis, Minn.

Objective: To cluster analyze the energy conservation actions of a sample of Pennsylvanians to determine whether patterns of conservation behaviour exist.

Method: In early 1980, a mail questionnaire was administered to a stratified, random sample of registered Pennsylvania drivers (N = 14,300). A subsample of 857 individuals was randomly selected from survey respondents. Cluster analysis was performed on the data relating to energy conservation behaviour.

Variables: Respondents were asked to report their actions on eight specific energy conservation behaviours: turned down residential thermostats; decreased use of car; installed weather stripping and/or insulation; purchased a fuel-efficient car; turned off the heat in part of the house; vacationed closer to home; purchased wood stoves; and used alternative energy sources. Other variables included demographic, socioeconomic and attitudinal characteristics.

Findings/implications: Five distinct types of conservers emerged from the analysis: Aggressive Conservers, Car-Oriented Conservers, Defensive Conservers, Low-Cost Conservers and Limited-Action Conservers. Only one of these groups, Aggressive Conservers, engaged in all eight conservation behaviours measured. Interestingly, all members of this group had installed wood stoves. The four remaining groups specialized in one or more of the types of action while ignoring the others. Car-Oriented Conservers, as the name suggests, were distinguished by the extent to which they tended to concentrate on actions which involved cars. The remaining three groups were less active in energy conservation than the first two. Defensive Conservers reported doing things which the majority of respondents reported doing. Low-Cost Conservers fell below the sample average on most of the energy conservation actions and tended to engage in inexpensive conservation behaviour. Limited-Action Conservers fell below average on all of the energy conservation actions and, in contrast to the other four groups, none reported using their cars less often.

Feick, Lawrence F., and Dan E. Moore (cont).

Demographic characteristics are strongly related to the various energy-conserving groups and appear to constrain the household's ability and willingness to conserve. Essentially, people respond in ways which are the most feasible for them. Aggressive Conservers, for example, tended to be rural, middle-aged, middle-income individuals. Those in rural areas may find it easier to install wood-burning stoves and to obtain and store wood than those in urban areas.

The authors conclude that policymakers should consider the impact which differences in attitudes and demographic characteristics have on individual and family responses to energy conservation policy. Because people have tended to respond in ways which are the most feasible and least expensive, further changes may be increasingly difficult, especially for some groups.

2007

Fenwick, Ian, Roger Heeler, and Patricia Simmie
1982 Identifying Early Adopters of Energy Conservation Products: A Preliminary Analysis.*
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objectives: To examine: (1) the characteristics of early adopters of energy conservation products; (2) early adopters' perceptions of innovative energy conservation devices; and (3) the effect of specific product features on new product adoption and diffusion.

Method: The analysis is based on data generated from a questionnaire mailed to random samples of homeowners in Montreal, Quebec, and Winnipeg, Manitoba. A response rate of just over 20% was achieved, which skewed the responses towards adopters of energy conservation products (N = 1,057).

Variables: Ownership of energy conservation products, opinion leadership, lifestyle, perceptions and evaluations of new product concepts, demographics.

Findings/implications: In this preliminary report on a continuing project, only the first of the objectives stated above is examined. The results indicate that early adopters of energy conservation products do not seem to be a demographically distinct group. Early adopters are upscale, that is, higher in income and education. However, upscale is not by itself a distinguishing feature. Early adopters do tend to be opinion leaders, providing information on energy conservation to their peers, and this characteristic should promote more rapid product diffusion, if early adopters generate positive product opinions.

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*For a condensed version of this report, see Ian Fenwick, Patricia Simmie and Roger Heeler, Early Adopters of Energy Conservation Products in Winnipeg: A Case Study. Ottawa: Consumer and Corporate Affairs Canada, 1984.

Fenwick, Ian, Roger Heeler, and Patricia Simmie 2008
1982 Switching Commuters from Car to Public Transit: A Micro Modelling Approach.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To examine the perceptions and values of commuters in Toronto, Ontario, concerning public transit and the private car.

Method: Interviews were conducted at an office location easily accessible by car, bus and subway. Respondents were characterized by their predominant commuting mode and provided ratings of the perceived benefits of the modes available. Respondents then completed a conjoint analysis task designed to estimate their trade-offs, or the extent to which they were prepared to sacrifice on one aspect of a commuting journey (i.e., privacy) in order to gain on another (i.e., cost). The conjoint analysis used a factional factorial design allowing main effects and two-way interactions to be estimated. These were used to model transportation mode choice.

Variables: Demographics; consumers' evaluations of product or service alternatives which differ on a number of characteristics and their utilities for different levels on these characteristics; consumers' perceptions of competing products or services using the same characteristics and characteristic levels.

Findings/implications: The research provides a pilot application of the conjoint analysis methodology and presents a framework for developing benefit segments and designing appeals for marketing public transit. This methodology has direct policy significance.

2009

Filho, Jovelino Carvalho Mineiro
1982 Electrostation — A Refueling Structure for Electric Vehicles.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

__Abstract__: This paper summarizes the findings of a comprehensive study carried out by Companhia Energetica de Sao Paulo, Brazil, on the implications and consequences of electric vehicles and recharging/exchanging stations for the transportation field. These stations, called electrostations, would remove the major obstacle facing increased utilization of electricity in transportation systems — the necessity of a physical attachment between the electrical supply and the vehicle. The paper draws attention to three areas which warrant consideration: the role of electric utilities as promoters of electric vehicle diffusion, the establishment of adequate standards for electric vehicles and for a refueling structure, and the development of a pilot electrostation for research and demonstration purposes.

Frankena, Frederick 2022

1982 Public Perception of Large Scale Renewable Energy Technologies: A Case Study of the Hersey, Michigan Wood-Electric Power Plant Controversy.

Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: During the last decade the environmental problem and the social movement it inspired served to define technology as a social problem. Controversies have persistently surrounded the siting of large-scale energy production facilities, namely, nuclear and coal-fired power plants. This paper sheds further light on public response to the scale of energy development by focusing on a dispute involving a renewable energy technology -- a 25 MW wood-fired electric power plant to have been sited in a remote nonmetropolitan community. Following a summary of the two-year (1979-80) controversy, facts/values, local/cosmopolitan orientations, and specific issues are analyzed from documentary sources and discussed in connection with the social and political impact of expertise. Findings include a shift toward value-related issues when experts disagree, the effective use of local orientation by cosmopolitan newcomers and the salience of local public concern about waste disposal. Implications are discussed for consumer behaviour and energy policy relative to the scale of renewable energy development.

2023

Frey, Cynthia J., and Duncan C. LaBay
1982 A Comparative Study of Energy Consumption and Conservation Across Family Life Cycle.
Presented at the 1982 Association for Consumer Research Conference, San Francisco, October.

Objective: To examine the relationship between individuals responding to a conservation campaign sponsored by a large electric utility in the New England area and nonresponding members of the general population.

Method: In February 1981, self-administered mail questionnaires were distributed to a known probability sample drawn from campaign respondents in Massachusetts and New Hampshire. A corresponding sample of the general population was drawn to ensure that the geographic distribution of the two samples matched closely.

Variables: Independent: family lifecycle, income, number of contributing incomes, demographic measures and various dwelling characteristics.

Dependent: heating costs for the previous 12-month period, including any supplemental sources of heat.

Findings/implications: Analysis of home heating costs across stages of the family lifecycle reveals a distinctly different pattern than previously found when total household energy costs were examined. In contrast to the curvilinear pattern where expenditures peak during the middle stages of the lifecycle, these data show a positive linear relationship where higher costs are associated with elderly consumers. The research focus is expanded to include heat-related conservation behaviour as well as expenditures in an effort to better understand implications for policymakers and marketers.

Fulenwider, Claire K. 2100
1980 Conservation Among Wisconsin Residents: Behavior and Motivation.
Wisconsin Centre for Public Policy.

Objectives: To determine what Wisconsin residents are actually doing in the way of residential conservation, why they do what they do and how they might be induced to engage in more conservation behaviours. Implications for state energy policies which would expand the levels and effectiveness of citizen conservation efforts are also discussed.

Method: As part of SOLPLAN, a U.S. Department of Energy project to study barriers and incentives to greater conservation and alternative energy use within the state of Wisconsin, a survey of Wisconsin residents was conducted in December 1979 and January 1980. A random statewide sample of 615 adult citizens was utilized.

Variables: Various energy attitudes and behaviours, demographic and socioeconomic variables.

Findings/implications: The results indicate that attitudinal support for conservation within the state is very high. In addition, 94.6% of the state's residents are in the process or have taken steps within the past two years to conserve energy use within their own homes. The average resident of Wisconsin has taken three such steps and spent a median amount of $224.00 on energy conservation within their residence in the past two years.

Income level positively affects both the type and number of conservation steps people take. Sex differences also appear to exist, with women being more aware than men of relatively easy-to-take-care-of home energy conservation efforts and men being more aware of or involved in capital- and effort-intensive activities. Geographical differences emerge as well.

Primary reasons for and barriers to Wisconsin residential energy conservation by consumer level are discussed, with financial considerations dominating. The authors conclude that since people conserve to save money, large cash grants/loans/subsidies could increase weatherization in the residential sector. The roles of government, utilities and banks in providing additional incentives for weatherization are also discussed.

2101

Fulenwider, Claire
1980 Information Sources and Energy Decision-Making. Wisconsin Centre for Public Policy.

Objective: To analyze the relationship between information sources and energy decision making for Wisconsin residents.

Method: Telephone interviews were conducted with 635 residents of Wisconsin using a statewide sampling procedure. A subsample of 151 of these residents was surveyed on a second wave. Residents were divided into three groups based on the extent and effectiveness of the conservation steps they had taken between 1978 and 1980. Every resident was classified as a high, low or average conserver. Users of alternative energy sources were compared to conservers to determine types of energy information source used and the importance of these information sources.

Variables: Conservation behaviour, type of energy used, attitudes toward various information sources, and demographic and socioeconomic variables.

Findings/implications: Use of energy information is influenced by several factors. Conservers tend to use information sources that vary from those used by alternative energy users. Alternative energy users vary their information sources depending on the type of alternative energy technology about which they are making decisions. Variations in energy information source use are also related to differences in demographic and socioeconomic factors such as occupational level.

The results of this study suggest that distributors of energy information need to analyze further who uses what energy sources and which types of energy information are likely to be sought in which sources. Information indiscriminately distributed has a low likelihood of ever reaching, much less influencing, the intended population.

2102

Fulenwider, Claire, and Don Wiener
1980 Decision Factors and Attitudes Among Wisconsin's Solar Adopters: Analysis and Policy.
Wisconsin Centre for Public Policy.

Objectives: (1) To discuss barriers to renewable energy use in residential dwellings in Wisconsin, with particular emphasis on active solar space and hot water heating; (2) to describe solar users by attitudinal and demographic data; (3) to compare users to nonusers in the state; and (4) to make recommendations for incentives that would speed the use of solar energy in the residential sector.

Method: In August 1980, telephone interviews were conducted with 216 renewable energy users in the state. A simultaneously matched survey (N = 151) of a subsample of the general population was conducted to facilitate comparisons between solar users and nonusers.

Variables: Various attitudinal, demographic and socioeconomic measures; conservation behaviour.

Findings/implications: Present solar users are substantially different from nonusers on attitudinal measures which influence solar investments. Solar users take greater risks financially and are more willing to take the initiative and experiment than are typical residents. The implications are clear. To extend the use of solar technology into other sectors of the residential market, two policy efforts appear crucial: (1) nonusers must be educated about the values, benefits and technology of solar energy use for residential buildings; and (2) financial incentives must be strong enough to urge the typical and more reticent homeowner to invest in solar technology.

In addition to the differences cited above, solar users are, on the whole, wealthier, more likely to be professional or managerial, younger and more educated than the average Wisconsin resident. They appear deeply committed to solar energy systems and express satisfaction with the economic returns they have experienced. Reasons for deciding to use solar systems are diverse, but tend to be dominated by financial factors.

2421

Geller, E. Scott
1981 Evaluating Energy Conservation Programs: Is Verbal Report Enough?
Journal of Consumer Research, 8, December, 331-335.

Objective: To determine the actual behavioural effects of energy conservation workshops.

Method: The attitudes, knowledge and behavioural intentions of those attending seven energy conservation workshops presented during the winter months of 1977-78 in Virginia were measured using a 21-item questionnaire. Subsequently, an evaluation of the actual behavioural effects of the workshops was accomplished by visiting the homes of 40 workshop participants and 40 residents who had not attended a workshop, and determining whether energy conservation actions had been taken.

Variables: Independent: attendance at a workshop.

Dependent: actually following through on an energy conservation action.

Findings/implications: Comparisons between the two groups indicated very few differences in the application of conservation techniques. The author concludes that this finding implies that efforts to evaluate the utility of programs for encouraging energy conservation should include behavioural checks on self-report indices. The author also concludes that workshops, informational pamphlets and media promotion should not be relied on to promote energy conservation unless they are supplemented with other techniques to motivate action.

Geller, E. Scott 2422
1981 The Energy Crisis and Behavioral Science: A Conceptual Framework for Large Scale Intervention.
In A.W. Childs and G.B. Melton, eds., Rural Psychology. New York: Plenum Press.

Abstract: The author admits to concern about the apathy of society regarding energy use. He states that communities must raise the consciousness of people to the reality of the energy situation in order to promote a national drive towards energy conservation. To this end, the primary focus of the article is to provide a conceptual framework for organizing large-scale action toward energy conservation. This framework takes the form of a 2 x 3 x 4 factorial array involving two intervention approaches, physical versus psychological; three community sectors, residential/consumer, governmental/institutional, commercial/industrial; and four targets within each sector, heating/cooling, solid waste management, transportation, equipment efficiency. The author then examines the resulting 24 three-dimensional cells, with numerous references to an exhaustive literature review. The conclusion of this lengthy, detailed analysis encompasses the following points. (1) The energy crisis is multifaceted and requires an interdisciplinary approach. (2) Numerous conservation strategies exist in each target area. (3) Many of these strategies require human intervention. (4) There is insufficient information on the cost-effectiveness of many conservation strategies. (5) There is support in the literature for communitywide approaches to conservation. (6) Dissemination techniques are urgently needed. Finally, the author outlines a general guideline, referred to as the Energy Conserving Community System, for disseminating conservation strategies throughout a community.

2464

Green, David, and Gill Owen
1982 Neighbourhood Energy Action: Its Impact on Energy Conservation.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: High energy costs have a direct impact on all consumers, industrial and domestic. The effect is particularly marked for low-income consumers, at home all day, spending large proportions of their incomes on fuel. Low-income groups usually lack appropriate information and the resources to invest in energy improvements. Appropriate schemes and resources, therefore, need to be focused on such communities.

This paper outlines initiatives being taken through the combined action of the City Council and community groups in Newcastle upon Tyne, England, to tackle the problems related to high energy costs. The authors have been actively involved in such initiatives, including utilizing employment programs to insulate the homes of low-income households; energy advice and information schemes for groups and individuals; and energy enterprises, that is, economically viable, community-controlled conservation services.

The paper also examines to what extent such initiatives are an essential part of national and international energy programs.

Gruber, Edelgard 2500

1982 Innovation Behavior in Private Households and Small Business with Respect to Energy Savings.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: Energy consumption in the household and commercial sector amounts to neary 45% of the West German end-use energy. Energy saving, however, is not only a national goal; energy cost is increasingly becoming a problem for the individual firm and household.

There are a large number of energy-saving measures, which include well-known techniques, organizational and behavioural measures as well as new techniques and construction methods. Despite governmental support efforts, however, the energy-saving possibilities are not being exhausted.

This limited acceptance of energy-saving measures can be explained in several ways: lack of detailed energy-specific information; underestimation of the effect of energy-saving measures; limited financial resources and investment priorities other than for energy savings; and apprehension of new techniques with regard to implementation risks, limited experience and perceived behavioural constraints.

The actual situation requires additional efforts to overcome the widespread attitudinal barrier to conservation posed by owners/builders and small entrepreneurs in order to promote innovative energy-saving architecture, production techniques and related behaviour.

2804

Hake, Don F., and Thomas Zane
1981 A Community-Based Gasoline Conservation Project: Practical and Methodological Considerations.
Behavior Modification, 5, 4, 435-458.

Objective: To determine if a community-based project as opposed to a college-based or a single location-based project with a more representative population would be feasible in terms of finding participants, maintaining their cooperation and achieving a sizeable reduction in miles driven.

Method: Volunteers were solicited from the area of Morgantown, West Virginia. A control group matched on the basis of baseline driving was used to evaluate the effects of time-correlated extraneous variables such as weather, changes in gas prices, etc. There were two conditions: a baseline condition during which no contingencies were attached to driving behaviour, but participants were paid for attending odometer checks, and a reinforcement condition during which participants earned more money and were asked to reduce the number of miles driven per day. Increased payments for the experimental group, but not the control group, were dependent on driving reductions.

Variables: Independent: treatment.

Dependent: miles driven.

Findings/implications: This study found that a community-based project was feasible in terms of recruiting participants, gaining their cooperation in reporting mileage and achieving a 15% average reduction in miles driven. Possibilities and problems for future community-based studies are described. For example, given the cooperativeness of some persons and increasing gasoline prices, will small monetary incentives remain practical? Problems exist in detecting artifactual effects due to changes in life events, holidays, weather and obedience to the rules. Solutions may necessitate a deviation from standard behaviour-analytic methodology (e.g., control groups, discussing driving habits with participants).

Hall, Robert E., and Robert S. Pindyck 2809
1981 What to Do When Energy Prices Rise Again.
Public Interest, 65, Fall, 59-70.

Abstract: The Reagan Administration's commitment to accelerated decontrol of natural gas and the decontrol of oil prices has virtually ensured future increases in the price of energy. The authors argue that the United States must design its national economic policy to respond to energy shocks and to minimize their impact. Rising energy prices have a direct effect on the economy by reducing the total real national income available for domestic consumption and investment. Energy price increases that are rapid and unexpected also have an adjustment effect on the economy in terms of higher inflation, increased unemployment and reduced investment. The most serious economic problems occur when energy prices increase sharply rather than slowly and steadily. The authors state that the heart of the problem is that wages fail to decline in response to increases in energy prices, which causes total production costs to increase and inflation to be fueled. Cost of living increases in response to price increases for fuel push in the wrong direction. The authors state that higher energy prices, in the long run, will serve to reduce the total resources available to the government and thus will reduce the level of government programs. They state that in the short run, monetary policy should not be used to try to offset the inflationary effect of an energy shock. In the short run, monetary policy should simply provide a stable monetary environment for private economic decisions. Well-designed tax policies can moderate the recessionary effect of an energy shock. First, special temporary incentives should be used to stimulate investment after a shock. Second, reductions in taxes such as excise and payroll taxes would reduce business costs, thereby lowering prices and increasing output. The authors conclude with a brief description of policies that would exacerbate the problem, followed by a statement of the policy mix that they favour -- mildly activist tax policies and free market energy prices.

2826

Hanson, Mark E.
1980 Personal Transportation Energy Policy Options.
ERC report no. 80-103, University of Wisconsin-Madison: Energy Research Centre.

Abstract: Fuel-economy standards, fuel taxes, carpooling, mass transit and alternative land-use patterns are among the policy options evaluated with the aid of a simulation model. Quantitative results are expressed in a matrix which shows energy-use impact on one scale and political acceptability on the other.

Hatherley, Marnie A. 2862
1982 An Assessment of the Environmental Implications of the Canada Oil Substitution Program in Manitoba.
Ottawa: Department of Energy, Mines and Resources.

Abstract: The purpose of this report is to identify and discuss the potential environmental implications stemming from the Canada Oil Substitution Program (COSP)'s encouragement of the utilization of "off-oil" heating fuels in Manitoba through the provision of taxable grants for conversion. The results of the study indicate that COSP, as it applies to the Manitoba situation, has been effective in reducing the number of oil-burning furnaces. The substitute energy forms of wood, natural gas and hydro electricity are, for the most part, the most popular alternatives due to accessibility, convenience and cost. The increased demand on these resources, as well as on the remaining COSP-funded energy sources of wind, peat, solar and propane, at present places neither an environmental nor a social strain on the resources. Even in the event of total oil substitution, the impact will be negligible. The COSP program appears to be an environmentally sound means of reducing oil consumption in the province.

2864

Hayes, R.V., and J.S. Angel
1981 Social, Legal and Economic Strategies to Encourage Energy Conservation in Buildings.
Environmental and Urban Studies Report No. 66, Centre for Environmental Studies, Macquarie University, Australia, March 1981.

Abstract: This study is about the social, financial and legal steps to energy conservation. It begins with an examination of energy consumption in four Australian building sectors: residential, commercial, industrial and institutional. The complex social issues and interactions involved in energy management are revealed in a discussion of the main interest groups in the building industry: builders, building owners and users, the government sector and researchers. The report provides an overview of techniques available to conserve energy in buildings. Three approaches are discussed: modification of building performance, adopting alternative energy technologies and changing the way people use buildings. Six groups of energy conservation strategies are then examined: information, persuasion, pricing, improving marketability, social inducements and regulation. Assessment is made of the suitability of each strategy in terms of several objectives and influence mechanisms.

Heberlein, Thomas A., David Linz, and Bonnie P. Ortiz 2874
1982 Satisfaction, Commitment and Knowledge of Customers on a Mandatory Participation Time-of-Day Pricing Experiment. Journal of Consumer Research, 9, June, 106-144.

Objective: To determine the attitudes of nonvolunteer customers toward time-of-day electricity rates.

Method: Data for the analysis are based on a questionnaire mailed to a random sample of residential customers served by the Wisconsin Public Service Corporation (N = 329). The basic design of the pricing experiment was a 3 x 3 ANOVA design with three price ratios fully crossed with three peak lengths. Customers were given information on time-of-day pricing as well as on energy-saving tips for appliance use.

Variables: Independent: treatment with respect to price ratio and peak length, demographics, dwelling characteristics.

Dependent: measures of customer satisfaction, perceptions of the fairness and reasonableness of rates, estimated savings due to time-of-day pricing, knowledge of time-of-day program, commitment to reducing electricity usage during peak periods, electricity consumption.

Findings/implications: The results indicate that even with peak to off-peak ratios as high as 8:1 and peak periods as long as 12 hours, customer satisfaction remained high. Over 80% of the customers reported some commitment to shifting appliance use, although customer knowledge of peak hours and price ratios was incomplete.

2876

Heberlein, Thomas A., and C. Keith Warriner
1982 The Influence of Price and Attitude on Shifting Residential Electricity Consumption from On to Off-Peak Periods. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To examine the effects of incentives and attitudes as inducements to conserve energy in the home, in the context of consumption of electricity by time-of-day.

Method: During a three-year period, a stratified sample of residential customers in northeastern Wisconsin was placed on one of three time-of-day price ratios, 2:1, 4:1 or 8:1 (N = 590). During the course of this period, subjects were asked to complete two mail surveys.

Variables: Independent: treatment; various measures of appliance ownership, demographics and attitudes; dwelling characteristics.

Dependent: electricity consumption, various treatment effects such as changes in household work scheduling.

Findings/implications: Customers with higher price ratios used less on-peak electricity ($B = -.15$, $p < .01$), while those who had a psychological commitment to shift shifted even more ($B = -.33$, $p < .001$). These two factors were largely independent. Those with a commitment to shift did so even at the low-price ratios. A more complete model which includes ability and knowledge shows that price influences behaviour by increasing knowledge. Both ability, in the form of increased appliance ownership, and price had direct effects on behaviour. The attitudinal variables, knowledge and commitment, had much larger effects on behaviour than the external variables price and ability. The data show that attitudes do influence behaviour in situations where consumers can save money by shifting. The data show also how increasing incentives increases both knowledge and commitment.

Heilman, John 2877

1982 Uses of Direct and Indirect Measures: A Case Study of Program Impact in the Energy Conservation Field. Evaluation Review, 6, 1, 61-79.

Objective: To assess the accuracy of selected direct and indirect measures of energy conservation program impact.

Method: The analysis is based on a case study of three sets of impact data generated by one of the Energy Extension Service's most successful pilot programs. Two indirect measures of increased boiler efficiency were obtained for a sample of boilers served by the program. The results were compared to 97 direct, pretest and post-test measures of increased boiler efficiency.

Variables: Independent: participation in the Alabama Boiler/Water Heater Efficiency Program.

Dependent: pretest and post-test measures of energy savings (direct), client's estimates of savings in monthly fuel bills as a result of program participation (indirect), program evaluators' projected estimates of savings attributable to improved efficiency based on pretest data (indirect).

Findings/implications: The indirect estimates are found to run about twice as high as the estimate based on before-and-after direct measurements and to suffer from large sampling errors. Although more accurate and reliable, direct measures can encounter problems of time and cost. In such cases, survey evidence on implementation rates can be combined with pretest evidence on possible savings to yield usable estimates of program impact.

2878

Held, Martin
1982 Social Impacts of Energy Conservation.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: Energy conservation measures not only reduce the level of energy consumption, but they may produce a number of side effects as well. Potential social implications are discussed with reference to equity and distributional impacts and to the voluntariness dimension. There are, of course, more general types of impacts; however, social impacts are especially sensitive to the specified design and conditions of energy conservation. To examine the implications of specific conservation measures as well as the impact of more comprehensive energy-conserving alternatives, two approaches which currently underlie the energy conservation debate are discussed: technological solutions and lifestyle alterations.

Hendricks, Wallace, Roger Koenker, and Dale J. Poirier 2879
1979 Residential Demand for Electricity: An Econometric Approach.
Journal of Econometrics, 9, 33-57.

Objective: To estimate the impact of various demographic characteristics on the shape and level of the residential demand curve for electricity.

Method: The data were generated by a peak-load pricing experiment conducted by Northeast Utilities. In addition, questionnaires were used to obtain demographic information on individual customers. Respondents were divided into test and control groups. An econometric model of demand was used in the analysis.

Variables: Independent: various demographic and household characteristics, weather conditions, price.

Dependent: electricity consumption.

Findings/implications: The authors conclude that, based on the preliminary results of the peak-load pricing experiment, their method of analysis is useful in modelling the level and shape of the demand cycle. The demographic variables did a reasonably good job of explaining the variability of the regression coefficients. Electric heating had the strongest single impact on consumption. Ways of improving the efficiency of the results are suggested and prospects for future research are suggested.

2881

Henion, Karl E. II
1981 Energy Usage and the Conserver Society: Review of the 1979 AMA Conference on Ecological Marketing.
Journal of Consumer Research, 8, December, 339-342.

Abstract: This paper provides an overview and synopsis of several papers presented at the 1979 AMA Conference on Ecological Marketing. The conference theme was "The Conserver Society," which signifies a perception of a finite world with limited, nonrenewable resources and a commitment to doing more with less. The author concludes that the principal contribution of the papers presented was a number of frameworks for considering the energy conservation of consumers. It is noted that the range of means seen at the conference was to be expected, given the diverse group of academics, corporate executives and government officials that participated. Ends, however, were generally undisputed.

2882

Henley, Davis H., Irwin P. Levin, Jordan J. Louviere, and Robert J. Meyer
1981 Changes in Perceived Travel Cost and Time for the Work Trip During a Period of Increasing Gasoline Costs. Transportation, 10, 23-34.

Objectives: (1) To examine the relationship between actual and perceived values of cost and time for the work trip; and (2) to examine how perceptions have changed over a period of dramatically increased travel costs.

Method: The travel habits and perceptions with respect to journeys to and from work for commuters in Iowa City, Iowa, were measured in the fall of 1978 and the fall of 1979. The first sample included 36 solo car drivers, 20 carpoolers and 17 bus users. The second included 52 solo car drivers and 36 bus users. Respondents were contacted by telephone. Self-reports of travel time and distance were verified.

Variables: Independent: mode of commuting to work, cost of gasoline.

Dependent: perceptions of travel cost and travel time, ratings of comfort and convenience of the primary mode.

Findings/implications: Time estimation was found to be related to attitudinal and situational factors. Not surprisingly, the less comfortable and convenient the trip was perceived to be, the longer the trip was perceived to have taken. The authors conclude that the increase in fuel costs which occurred between the two sample periods resulted in individuals being more conscious of the actual costs of driving to and from work. Although a stronger relationship between actual and perceived costs emerged in Survey 2 than in Survey 1, individuals in the study area still underestimated driving costs.

2883

Heslop, Louise A., Lori Moran, and Amy Cousineau
1981 "Consciousness" in Energy Conservation Behavior: An Exploratory Study.
Journal of Consumer Research, 8, December, 299-305.

Objective: To examine the importance of various attitudes with respect to electricity conservation behaviour in a period of rapidly rising prices.

Method: A sample of 136 respondents from a midsize, southwestern Ontario city responded to questions on demographic and household characteristics, and on attitudes, actions and opinions concerning energy use. The respondents also granted permission to have their electricity billings for the period 1973-78 examined.

Variables: Independent: price consciousness, social consciousness, energy conservation consciousness, environmental consciousness, demographic and household characteristics.

Dependent: kilowatt hour consumption of households for each year between 1973 and 1978 and the total over the 1973-78 period, changes in kilowatt hours over the six-year period, acceptability of policy alternatives to restrict consumption.

Findings/implications: In terms of the "consciousness" variables, personal sensitivity to price was the most relevant indicator of energy-use behaviour. The stock of capital goods, household size and price-related attitude variables were also very important. The authors note that as electricity prices are somewhat less obvious to consumers, it is quite likely that the role of price-sensitive attitudes would be even more important in the home-heating and automobile fuel areas. They conclude with the statement that increasing prices are generally acknowledged to be one of the most effective means of curbing consumption, but raising price sensitivity may also be helpful.

Hirshhorn, Ron 2884
1978 A Case Study of the Proposals for Energy Consumption Labelling of Refrigerators.
Working paper no. 1. Ottawa: Economic Council of Canada.

Abstract: This paper focuses on the federal Energuide program's energy-labelling requirements for refrigerators. The benefits of refrigerator labelling were estimated by first looking at the total gains that are likely to arise from the pressure of market forces toward the development of more energy-efficient refrigerators. These gains are measured by the difference between the manufacturing costs associated with the development of more energy-efficient refrigerators and the value of the associated energy savings. To distinguish the benefits that are associated with Energuide, an estimate was made of the gains to the economy if the progression to more energy-efficient refrigerators was to proceed somewhat more slowly; the specific judgement incorporated in the study was that, in the absence of Energuide, there would be an additional time lag of two to four years in the introduction of energy-saving improvements. It was found that, by accelerating the development of more energy-efficient refrigerators, Energuide is likely to yield very substantial real resource savings. The possible savings are particularly impressive in relation to the rather modest costs of the program. This is the case even using the most conservative assumptions with respect to the appropriate discount rate, the future trend in energy prices and the contribution of the labelling program towards accelerating market developments. An examination of distributional effects and some of the other more general, though nonquantifiable, implications of the program did not alter the general conclusion suggested by the data on the costs and benefits of the program.

2886

Hirst, Eric
1981 Measuring the Effects of Utility Conservation Programs. Public Utilities Fortnightly, December 17, 1-4.

Abstract: As utility conservation programs grow in size and cost, it becomes increasingly important to measure the actual effects of these programs on energy consumption. This article discusses some of the basic issues associated with evaluations of the effectiveness of utility conservation programs. It supplements an earlier FORTNIGHTLY article on residential energy audit programs in that it draws upon actual fuel consumption records, which were not available at the time the earlier article was written, to measure the energy-saving effects of such programs.

Hirst, Eric 2887

1981 Understanding Residential/Commercial Energy Conservation: The Need for Data.
Journal of Energy and Development, 6, 1, 86-108.

Abstract: This paper focuses on different types of data sources that provide information on energy-consumption patterns in the residential and commercial sectors and on the determining factors of energy use (i.e., attic insulation in new homes, average age of commercial buildings). The data paint a rough and spotty picture concerning energy use, changes in energy consumption and determinants of these changes. The major conclusion drawn from the discussion is that existing data are inadequate for answering the questions raised about energy use and conservation in residential and commercial buildings. The author provides several reasons for why data sources need to be improved, and some suggestions for achieving this objective.

2888

Hirst, Eric
1980 Review of Data Related to Energy Use in Residential and Commercial Buildings.
Management Science, 26, 9, 857-870.

Abstract: This paper reviews data dealing with energy use in residential and commercial buildings and its determinants. Three types of data are discussed: data prepared by and for the federal government on overall trends in energy use in buildings, data prepared by and for the federal government related to the details of energy use, and data collected at the state and utility level. It is concluded that existing national data sources are inadequate for answering the questions being raised about buildings, energy use and conservation. These questions concern overall trends, recent changes, determinants of changes, the role of the private sector and government, and the effectiveness of different kinds of government programs. Relevant data are being collected by many state energy offices and by gas and electric utilities; however, the existence of these potentially useful subnational data sources is not widely known.

2889

Hirst, Eric, and John R. Armstrong
1980 Managing State Energy Conservation Programs: The Minnesota Experience.
Science, 210, November, 740-744.

Abstract: In the fiscal year 1980, the Department of Energy awarded grants for state energy conservation programs that totalled more than $400 million; the proposed figure for fiscal year 1981 is almost $600 million. Many states provide additional funds to implement conservation programs. This suggests that state governments play a major role in delivering conservation services to their citizens and are key agents in the nation's conservation efforts. This article discusses the energy conservation activities and responsibilities of one state energy office, the Minnesota Energy Agency, and the obstacles and constraints it faces in delivering its services. Suggestions are presented for resolving these difficulties and for improving the efficiency with which the agency manages its programs. Since all government programs suffer inevitable delays and inefficiencies, the authors conclude that more attention must be devoted to policy analysis, program planning and program evaluation. In addition, government programs must be directed toward conservation issues, such as retrofitting rental housing, that are clearly not being acted on adequately by the private sector. Finally, different types of government activities, including education, regulation and information, need to be combined into mutually reinforcing programs.

2891

Hirst, Eric, Linda Berry, and Jon Soderstrom
1981 Review of Utility Home Energy Audit Programs.
Energy, 6, 7, 621-630.

Abstract: Evaluation efforts of utilities with active home energy-audit programs were reviewed to provide insights into the operations and effectiveness of these programs. About half the utilities contacted had little or no evaluation activity. Of those with evaluation activity, most conducted only informal evaluations for in-house use. A few utilities had conducted fully documented formal evaluations. On the basis of written reports received from the utilities, findings about customer response to programs are summarized. The topics discussed include determinants of program participation rates, use of financing, attitudes toward programs, actions taken, characteristics of participants and energy savings due to programs.

Hirst, Eric, and Janet Carney 2892
1978 Effects of Federal Residential Energy Conservation Programs. Science, 99, February, 845-851.

Abstract: The authors employ a detailed engineering-economic simulation model of residential energy use to evaluate the effects of nine different residential energy-use futures. They conclude that energy use will grow more slowly in the future than it has in the past. Assuming that real fuel prices will remain constant between 1976 and 2000, the authors predict a 2.3% per year increase in consumption. In case two, the baseline, they assume that fuel prices in the year 2000 will be roughly 40% higher than in 1976, and that this will serve to reduce energy consumption by 15% by the year 2000. The next three situations involve appliance efficiency standards, thermal performance standards and a program to retrofit existing housing units; these could reduce energy consumption growth to 1.2% per year. Of the three programs, retrofitting existing homes would provide the largest energy and economic benefits. The model also indicates that zero energy growth can be achieved in the residential sector with higher fuel prices. It is concluded that government residential energy conservation programs can substantially reduce energy use and household expenditures. Programs stronger than those in the National Energy Plan, particularly if focused on equipment and structural improvements, will yield even larger savings.

2893

Hirst, Eric, and Janet Carney
1977 Residential Energy Conservation: Analysis of U.S. Federal Programs.
Energy Policy, September, 211-222.

Abstract: This paper reviews three residential energy conservation programs developed by the U.S. federal government. The analysis was conducted by means of a detailed engineering-economic model of residential energy use. The three programs studied were: FEA's appliance efficiency targets, HUD's program to develop thermal standards for new construction, and a nationwide program to retrofit single-family units. Each program was evaluated for its effects on residential energy use, by fuel type and in the aggregate, and on household economics between 1977 and 2000. Due to slower growth in population, changes in fuel-price trends and saturation of equipment ownership in households, it is suggested that residential energy use will grow at a much slower rate during the fourth quarter of this century than it did in the third. Implementation of the three programs would reduce energy use by the year 2000 by a further 15% over the reduced levels attributable to the above-mentioned variables. It is noted that there is a need for additional federal efforts to continually update and revise the energy-efficiency standards. Also, education and information programs should be expanded to help consumers make rational decisions concerning the purchase and use of household equipment and structures. The authors also conclude that financial incentives may be needed to spur conservation actions.

Hirst, Eric, and Janet Carney 2894
1977 Residential Energy Use to the Year 2000: Conservation and Economics.
Springfield, Va.: National Technical Information Service, U.S. Department of Commerce.

Abstract: This report evaluates the energy and direct economic effects of implementing various residential energy conservation programs. These evaluations are conducted using a detailed engineering-economic model that simulates residential energy use on an annual basis from 1970 through 2000. These programs include the following, which were authorized by the 94th Congress and expanded upon by the then present administration: appliance efficiency standards, thermal standards for construction of new residences and weatherization of existing housing units. In addition to these federal programs that are being, or will be implemented in some form, two additional measures to save energy are considered: large fuel-price increases and elimination of all market imperfections associated with the production and purchase of new equipment and homes. Altogether, nine different residential energy "futures" are considered.

The highest projection, which assumes constant real fuel prices from 1976 to 2000, shows residential energy use growing from 6 QBTU in 1976 to 28 QBTU in 2000, with an average annual growth rate of 2.3%. The baseline, which assumes rising fuel prices, yields an energy-use estimate of 24 QBTU in 2000. Implementing all the federal programs listed above would cut energy use in 2000 by 11%, to 22 QBTU. Adopting these programs also reduces energy-related costs to households by $27 billion. Raising fuel prices by 50% after 1984 and eliminating all market imperfections yields essentially zero energy growth in the residential sector. However, the cost to households of higher fuel prices amounts to about $60 billion.

2896

Hirst, Eric, William Fulberson, Roger Carlsmith, and Thomas Wilbanks
1981 Improving Energy Efficiency: The Effectiveness of Government Action.
Sponsored by the Office of Conservation and Solar Energy, U.S. Department of Energy.

Abstract: Energy conservation involves the substitution of intelligence, prudence, maintenance and better equipment for scarce and costly energy. These substitutions improve the efficiency of energy use and thereby enhance economic productivity. In addition to the economic benefits of lower costs for energy services, conservation reduces dependence on foreign oil supplies, reduces the environmental impacts of energy production and provides time to develop additional energy resources.

The benefits of conservation are clear, but the proper role of government is hotly debated. Although the normal workings of the market system (higher fuel prices) are doing much to stimulate cost-effective conservation actions, several barriers to conservation still exist. Government programs are needed to help overcome barriers which are related to inappropriate fuel prices, government regulations, lack of information, inertia and capital cost. These programs can take several forms to stimulate and hasten adoption of conservation actions.

Although the methodology for estimating future benefits of government programs is not fully developed or verified, recent analyses indicate that present Department of Energy conservation programs could reduce annual energy use by 2.7 Quads in 1985 and by 13 Quads in 2000. These savings are over and above those due to normal market forces (higher fuel prices), federal tax credits, new car fuel-economy standards and decontrol of oil and gas prices. The estimated cumulative oil saving for this 20-year period is 41 Quads; the present worth of the oil saving at an assumed $10 per barrel incremental social cost is $50 billion. This economic benefit is in addition to the savings realized by energy consumers themselves. These estimates are reinforced by evaluations of the effectiveness of specific government programs and by considerable anecdotal evidence.

2897

Hirst, Eric, Richard Goeltz, and Janet Carney
1981 Residential Energy Use and Conservation Actions: Analysis of Disaggregate Household Data.
Office of Conservation and Solar Energy and the Energy Information Administration, U.S. Department of Energy, March 1981.

Abstract: The authors provide a summary and analysis of the data from the National Interim Energy Consumption Survey (NIECS). NIECS includes extensive information on 4,081 individual U.S. households. The survey includes actual fuel consumption data, heating and cooling degree day data as well as the results of 45-minute interviews for each of the 4,081 households. The regression equations constructed in the analysis explain roughly half of the variation in energy use among households. The most important variables in explaining household energy-consumption differences were found to be fuel price, the year the house was built, floor area and heating degree days. Total annual energy use was found to be the most important determinant of retrofit energy saving; other significant variables were age of head of household, household income, year house was built, housing tenure, and proxies for the cost of heating and air-conditioning the house. The authors conclude with suggestions for improving NIECS; however, they acknowledge that NIECS is probably unparalleled anywhere, for it contains information on demographic characteristics, energy-related features of the structure, heating equipment and appliances therein, recent conservation actions taken by the household, and fuel consumption and cost for the April 1978-March 1979 one-year period.

2898

Hirst, Eric, and Mark Haller
1980 Analysis of Single-Family Home Characteristics and Energy Use in Minnesota.
St. Paul, Minn.: Minnesota Energy Agency.

Objective: To present and analyze the information collected and developed by Northern States Power Company (NSP)'s Project Conserve, a computerized home energy audit offered to the company's 540,000 Minnesota residential customers living in structures with one to three dwelling units.

Method: Data on the energy-related characteristics of homes and their occupants were obtained from 90,000 households in 1979 using a 67-item questionnaire. Questionnaire responses were then processed with an engineering analysis computer model that estimated annual energy consumption and costs for heating and air conditioning. In addition, the model computed the likely energy savings of adopting different conservation measures.

Variables: Independent: thermal characteristics of residential structures; fuel choices for space heating, water heating, cooking and clothes drying; type of air conditioning system; occupant behaviour with respect to temperature settings.

Dependent: annual fuel use and costs for heating and air conditioning, estimated energy and dollar savings and initial costs for certain retrofit measures.

Findings/implications: Overall, the data suggest considerable potential for retrofitting Minnesota's stock of existing homes. More than half the homes in this sample had less than seven inches of attic insulation, including 12% that had no attic insulation. A sizeable minority of the respondents indicated a need for measures to control infiltration of outside air in winter (i.e., lack of weather stripping and caulking, rattling windows, static electricity). On the other hand, almost all the windows and more than half of the exterior doors had storms.

Hirst, Eric, and Jerry Jackson 2899

1979 Energy Demand and Conservation in U.S. Residential and Commercial Buildings: Impact of the U.S. National Energy Plan. Energy Policy, September, 208-214.

Abstract: The authors utilize models to forecast energy use by fuel, building type and end-use on an annual basis for the period 1970 to 2000. They examine three general elements of the National Energy Plan (NEP), namely, appliance efficiency targets, performance standards for new construction and a retrofit program. Two simulations were used to determine the impact of these aspects of the NEP. The first involves an assumption of lower fuel prices without the NEP to establish a baseline. The second, with the NEP in place, involves higher energy prices. The energy demand growth rate in buildings is found to be reduced from 2.7% per year growth under the baseline condition to 2.1% per year growth under the NEP. This reduction is comprised of a residential sector growth rate reduction from 1.8% to 1.5% and a commercial sector reduction from 3.9% to 3.1%. Energy savings under the NEP are projected as 1.3×10^{15} BTU in 1980, 3.8×10^{15} BTU in 1990 and 5.7×10^{15} BTU in 2000. At present (1979) prices this would entail a net savings of $22 billion.

2901

Hirst, Eric, and Jerry Jackson
1977 Historical Patterns of Residential and Commercial Energy Uses.
Energy, 2, 131-140.

Abstract: This paper reviews trends in residential and commercial energy use for the 1950-75 period. Historical data on energy use by type of fuel, including electricity, gas, oil, etc., are presented for both sectors. These energy-use data are compared with data on the following determinants of energy use for each sector: population, per capita income, fuel prices, economic output from the service sectors and commercial building floor space.

The historical data show marked differences between the 1950-72 and 1972-75 periods. From 1950 to 1972, energy use in both sectors grew steadily and rapidly. Since 1972 energy-use growth has been mostly static and unstable. The data show, in a general way, the influence of changes in fuel prices and economic activity on energy use.

2902

Hirst, Eric, and Raj Talwar
1981 Reducing Energy Consumption in Low-Income Homes: Evaluation of the Weatherization Programs in Minnesota.
Evaluation Review, 5, 5, 671-685.

Objective: To evaluate the energy savings achieved in Minnesota's low-income households due to a federal weatherization assistance program. This program seeks to improve the thermal performance of these homes and thereby reduce the economic hardship faced by these households because of high and rising fuel prices.

Method: Fuel consumption records were obtained from 59 low-income households throughout Minnesota that had received weatherization services and from 37 low-income households that had not yet been weatherized.

Variables: Independent: participation in the program.

Dependent: fuel consumption.

Findings/implications: Comparisons of fuel consumption across the two groups for the 1976-77 and 1977-78 winters showed that the average saving due to weatherization was 13% of total household energy use. Based on fuel prices that prevailed in 1979, the cost of weatherization is likely to be recouped, in the form of lower fuel bills, in three to four years.

2907

Houthakker, H.S., Philip K. Verleger, Jr., and Dennis P. Sheehan
1974 Demand for Gasoline and Residential Electricity.
American Journal of Agricultural Economics, May, 412-418.

Abstract: This paper, written shortly after the oil embargo of the early seventies, draws attention to the relationship between the real price of energy and the demand for it. The authors conclude that arguments made for energy rationing are unfounded and that the market mechanism itself is capable of bringing about the necessary adjustments in demand. These conclusions are based on analyses of several data sources: gasoline consumption data from the American Petroleum Institute and the Federal Highway Administration; electricity consumption data from the Edison Electric Institute's Statistical Year Book; gasoline price data published in the American Petroleum Institute's Petroleum Facts and Figures; personal income data from various government sources; population data from the U.S. Census Bureau; and Price Deflators from the U.S. Department of Commerce. Analysis of the data was performed with a classical adjustment model of demand, which assumes that the stock of energy-using capital is to be fixed over the short run and that its utilization is a function of normal economic influences. The error components technique was chosen as the method of analysis.

Hutton, R. Bruce 2911
1982 Advertising and the Department of Energy's Campaign for Energy Conservation.
Journal of Advertising, 11, 2, 27-39.

Abstract: Motivating consumers to conserve energy has proven to be a difficult task in the United States. One tactic that has been used on a limited basis by the Department of Energy (DOE) is paid advertising. This paper examines the role of conservation in the context of the country's broader energy problems, delineates several consumer issues that affect the success of government conservation programs, discusses the controversy surrounding the use of paid advertising to promote consumer conservation efforts and describes those DOE programs which have used paid advertising as an integral component of conservation program strategy.

2912

Hutton, R. Bruce, and Dennis L. McNeill
1981 The Value of Incentives in Stimulating Energy Conservation. Journal of Consumer Research, 8, December, 291-298.

Objective: To report the results of the Department of Energy's Low Cost/No Cost Energy Conservation Program (LC/NC).

Method: A field experiment was set up as a post-test-only comparison group study in the six New England states exposed to the LC/NC. Selected upstate New York counties were used as the control due to similar weather conditions, dependence on heating oil, amount of energy conservation activity, and age and type of home. Overall impact was measured through a telephone survey of 1,207 New England households and 604 New York households.

Variables: Independent: demographics and housing characteristics, exposure to the LC/NC, read the LC/NC brochure, incentive.

Dependent: energy conservation action.

Findings/implications: More readers than nonreaders reported installation of the shower-flow device (58% vs. 22%). More readers reported turning down the thermostat on their hot water heater (67% vs. 55%). More readers reported checking for gaps around the fireplace damper (71% vs. 58%). Readers were more likely to seal gaps (86% vs. 77%). More readers checked for leaks in the attic (60% vs. 47%). More readers checked for outside openings or cracks (70% vs. 57%). More readers made adjustments to their furnaces (69% vs. 53%). It was also found that the number of tips used by readers who had installed the shower-flow device was greater than the number of tips used by nonreaders who had installed the device. Approximately 71% of the New England sample reported reading the LC/NC booklet, and this readership was found to be positively related to program effects. The authors conclude that inexpensive and small-scale conservation measures performed by households can produce significant energy savings. Finally, it was found that the use of the incentives and other LC/NC components resulted in significant behavioural change within just two weeks of the end of the LC/NC efforts.

3601

Jacobs, Harvey E., David Fairbanks, Cheryl E. Poche, and Jon S. Bailey
1982 Multiple Incentives in Encouraging Carpool Formation on a University Campus.
Unpublished manuscript, Florida State University.

Objective: To evaluate the effects of a combined token economy and reserved parking program as a means of increasing carpooling among students on a university campus.

Method: Following a baseline period, students in two experimental parking lots were notified of the availability of reserved parking and coupons redeemable for 25 cents in merchandise for each occupant of automobiles containing two or more people. Two control parking lots were also monitored for a comparison of treatment effects.

Variables: Independent: three-component treatment program: (1) reserved carpooling lot; (2) token reinforcers for carpool occupants; and (3) a computer-generated match list of neighbouring students interested in carpooling.

Dependent: levels of carpooling.

Findings/implications: Results indicated variable increases in carpooling in the two experimental lots and no increase in the control lots. Removal of the 25 cent coupons from one treatment lot (reserved parking only) did not adversely affect rates of carpooling. An analysis of individual automobile occupancy rates among carpoolers indicated distinct patterns of carpooling and underscored the importance of individual subject data analysis in the present situation. A cost-benefit analysis indicated that even moderately effective carpool programs can be cost-effective on both public and personal levels.

3602

Jacobs, Kenneth, and Avraham Shama
1981 Defining Energy Conservation: A Behavioral Perspective. Energy Communications, 7, 6, 582-605.

__Abstract__: A complete and accurate evaluation of energy conservation potential in buildings requires three perspectives: behavioural, economic and technical. Unfortunately, recent behavioural research has tended to ignore technical and economic factors concerning building conservation, while policymakers have tended to explicitly deny the behavioural perspective. This paper considers the question of the proper definition of energy conservation. It demonstrates that the conventional, two-dimensional, technical-economic definition of energy conservation is inadequate. An energy conservation definition that accurately assesses conservation potential must take into account technology, the economy and behaviour.

Jaffee, Bruce L., Douglas A. Houston, and Richard W. Olshavsky 3603
1982 Residential Electricity Demand in Rural Areas: The Role of Conservation Actions, Engineering Factors and Economic Variables.
Journal of Consumer Affairs, 16, 1, 137-151.

Objective: To determine whether energy conservation actions taken by consumers account for significant reductions in energy usage after the effects of economic and engineering variables have been taken into consideration.

Method: A model of residential electricity demand using economic, engineering and conservation variables was tested using data from a sample of rural residential customers (N = 951) served by 18 rural electric membership cooperatives in central and southern Indiana. Both questionnaire-generated data and information on actual energy usage were used.

Variables: Independent: three variables representing the stock of electricity-using devices, two measures of electricity price, past energy-conserving actions, demographics, characteristics of the housing unit.

Dependent: annual electricity usage.

Findings/implications: Electricity usage was found to be dependent upon past energy conservation efforts, even when household income, electricity prices, appliance stocks, space heating and cooling stocks, and housing characteristics were taken into account. The investigation also developed a ranking of receptivity to alternative conservation strategies. It supports public and private policies aimed at improving consumer attitudes toward energy conservation.

3608

Jeppesen, John C.
1982 Community Energy Action and Sequential Learning. Presented at the Small City and Regional Community Economic and Energy Futures Conference, Stevens Point, Wis., March 25-26, 1982.

Abstract: This paper describes how a community-based energy conservation organization can be formed to guide a series of integrated public programs. Each of these programs is directed at saving on energy costs. The approach discussed shows how high technology infrared scanning can be effectively coupled with information and action opportunities tailored to the consumer. Following an examination of the social learning theory on which this approach is designed, midproject evaluation findings are presented.

Kalt, Joseph P. 4000

1983 The Creation, Growth and Entrenchment of Special Interests in Oil Price Policy.
Discussion Paper Series, no. E-83-02. Cambridge, Mass.: Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University.

__Abstract__: The author argues that the dominant source of the U.S. failure to perform well under conditions of rising oil prices has been federal energy regulatory policy, which has consistently forestalled the adjustment by both energy producers and energy consumers to a world of higher prices. The consequence of attempts to ease the individual's adjustment to higher energy prices has been the creation and solidification of vested interests ultimately unwilling to relinquish their access to this regulatory largess.

The author determines that regulatory policy from 1971 to 1981 has had significantly adverse effects on the health of the national economy, which has resulted in the waste of national resources in the billions of dollars. The complexity, pervasiveness and longevity of the program of federal regulation of petroleum prices serve as important lessons in regulatory control design.

The author maintains that, although public interest in the performance of the overall economy is not identical with the private interests of individuals, deregulation was forestalled because the interest groups with stakes in price regulation put up a battle to preserve the federal regulatory apparatus.

4001

Karns, David A., and Inder P. Khera
1982 U.S. Consumer Attitudes and Home-Heating Conservation Behavior: A Multiattribute Longitudinal Model.
College of Business Administration, Wright University, Dayton, Ohio.

Objective: To construct a longitudinal multivariate model encompassing several of the major variables affecting residential energy conservation.

Method: Mail panel surveys were conducted during the winter months of 1979, 1980 and 1981 in a medium-sized U.S. metropolitan community.

Variables: Various energy-related perceptual/attitudinal/behavioural variables, demographics, conservation behaviour.

Findings/implications: The results are presented in the form of a multivariate causal model with cross-lagged correlations over time. Perceptual/attitudinal/behavioural variables were found to be the major causal factors, with certain other variables having secondary effects. Demographic variables were not significant in explaining actual conservation. The model presented is a rational, parsimonious model which suggests several significant avenues for public policy, including implications of potentially effective conservation messages, audience segments and time required for such interventionist strategies to show results.

Kasulis, Jack J., David A. Huettner, and Neil J. Dikeman 4002
1981 The Feasibility of Changing Electricity Consumption Patterns.
Journal of Consumer Research, 8, December, 279-290.

Objective: To study how the supply and demand of residential electricity can be synchronized so that the difference between peak and off-peak periods is diminished.

Method: A social experiment was conducted between March 1, 1977, and November 30, 1978, in Edmond, Oklahoma, a city with a population of over 25,000. The study involved three stages: a preexperiment survey, the experiment and a postexperiment survey. Experimental rates were implemented on September 1, 1977, and remained in effect through August 31, 1978. The preexperiment survey sample consisted of 1,452 respondents. The three experimental treatments were rates and rate structure, group versus individual rates and information feedback. Subjects for the experiment were selected from the preexperiment survey sample. Following the completion of the experimental period, the participants in the study were reinterviewed.

Variables: Independent: various rates and rate structures, group versus individual rates, feedback.

Dependent: demand for residential electricity.

Findings/implications: The authors conclude that peak and off-peak power are weak substitutes and that the short-term demand elasticities are lower than elasticity estimates in nearly all other time-of-day (TOD) studies. Several suggested explanations are provided for the differences found between this and other TOD studies. Since subjects were unwilling to make even minor lifestyle changes, the authors conclude that more substantial peak/off-peak price differentials are needed in low-cost residential markets. Consumers were willing, however, to make some modification in the scheduling of activities in response to information feedback. Of the demographic variables, only home ownership was statistically related to the results.

4006

Katz, Reinhard B.
1980 Marketing Methods to Reduce Energy Consumption: A Comparative Analysis of Their Impact on Consumers.
Master's Thesis, College of Business Administration, The Pennsylvania State University.

Abstract: This paper examines a number of different marketing or demarketing methods which have been used, or can be used, to reduce energy consumption. Advantages and disadvantages are discussed for methods which range from the pure supply of information to the offer of incentives or rewards. The results of empirical studies that have dealt with one or more of these methods are reviewed, and their major shortcomings are outlined. Finally, a study is proposed to determine the long-range effectiveness of combining a number of these marketing techniques.

4018

Katzev, Richard D., and Theodore R. Johnson
1982 A Social Psychological Analysis of Residential Electricity Consumption: The Impact of Minimal Justification Techniques.
Unpublished manuscript, Reed College, Portland, Oreg.

Objective: To explore the impact of the Foot-in-the-Door technique on residential energy conservation.

Method: A sample of 66 homeowners was asked to curtail electricity consumption by 10%. In the Foot-in-the-Door condition, this target request was preceded by a more moderate one, to answer a short energy conservation questionnaire. Homeowners in the Second Request Only condition simply received the conservation request, while those in the First Request Only condition received the questionnaire alone. These groups were compared to a control group of homeowners who were not asked to comply with either request.

Variables: Independent: type of treatment.

Dependent: electricity consumption.

Findings/implications: The groups did not differ in electricity consumption during the 2-week baseline period or in their percentage change from baseline during the 1-week request period. Throughout the 12-week follow-up period, however, homeowners in all three request groups consumed significantly less electricity than controls. In addition, the Foot-in-the-Door group contained significantly more conservers than any other group. These findings were contrasted with the results of behavioural energy studies emphasizing strong external justifications. The implications of minimal justification techniques for producing long-term maintenance of energy-conserving behaviours and for promoting their occurrence across a large population of individuals were also discussed.

4019

Kempton, Willett, Peter Gladhart, and Dennis Keefe
1982 Home Insulation: The User's View.
In F.A. Govan, D.M. Greason, and J.D. McAllister, eds., Thermal Insulation, Materials, and Systems for Energy Conservation in the 80's. American Society for Testing and Materials, ASTM STP 789, 69-80.

Abstract: Residential insulation in Michigan is studied from the user's point of view. From surveys and open-ended ethnographic interviews, a consumer analysis is conducted to determine who is adding insulation, how they decided to do so and what financial savings they expected. The accuracy of family knowledge about their existing insulation, savings from various energy actions and methods for computing savings due to recently installed insulation are tested. The results indicate a steady rate of retrofitting in Michigan, prompted by higher energy prices and by a desire for greater comfort. Unfortunately, the results indicate that insulation may not be installed, or may be installed in suboptional quantities, due to families' overestimation of current insulation or underestimation of economic savings. Families measure their energy consumption in dollars, but calculated savings are often underestimated because of failure to control for fuel price escalation. The authors conclude that more comprehensive, dwelling-specific information services could greatly increase the efficiency of energy use in residences.

4021

Kempton, Willett, Craig K. Harris, Joanne G. Keith, and Jeffrey S. Weihl
1982 Do Consumers Know "What Works" in Energy Conservation? Presented at the 1982 Summer Study, American Council for an Energy-Efficient Economy, Santa Cruz, Calif., August 22-28.

Objective: To analyze consumers' choice of conservation measures and their beliefs about the financial saving they expect from each measure.

Method: The data used in the analysis are based on surveys of over 3,000 Michigan households in conjunction with a mail audit program.

Variables: Respondents were asked an open-ended question about the kinds of measures which they could use to reduce energy consumption in the house and their beliefs about the cost-savings of such measures. Audit responses were also collected.

Findings/implications: This paper divides energy conservation into three types: efficiency investments, management and sacrifice. When asked how they could save energy, consumers mention management and sacrifice measures first, and more frequently, then efficiency investments. When asked about the dollar savings they could expect from these measures, they overestimate the savings potential of management and sacrifice, and underestimate the potential of efficiency investments. Consumers' estimates of savings are not strongly related to the actual savings potential of their homes; rather, each single individual tends to estimate savings as high or low across all conservation measures.

4022

Kempton, Willett, and Laura Montgomery
1983 Folk Quantification of Energy.
Energy — The International Journal, in press.

Objective: To study folk quantification, that is, the techniques which consumers use to measure energy costs.

Method: The data were generated using ethnographic methods. Thirty Michigan families were interviewed in 1980. Interview data were compared with utility consumption data. The sample included equal proportions of families who had reduced energy consumption and families who had not.

Variables: Consumers' measurements of monthly consumption, changes through time, comparison of appliances and length of payback period.

Findings/implications: Because of systematic errors in quantification, consumers choose ineffective energy conservation actions and underestimate the benefits of previous actions. These errors do not result solely from lack of information, since they are made even by consumers who understand technical energy measurement. To explain the persistence of a seemingly disadvantageous system, it is shown that consumer methods are cognitively efficient. They are easy to learn and use, and are compatible with general-purpose budgeting tasks; however, they lead to higher energy use than would be economically optional for either the individual or the nation.

4023

Kirby, D.M., and B. Bragg
1980 Fuel Consumption Survey: New Car Purchasers. Prepared for Road and Motor Vehicle Traffic Safety Branch, Transport Canada.

Objective: To determine what factors new car buyers took into consideration when making their selections and whether Transport Canada's fuel consumption information program influenced their decisions.

Method: A telephone survey was conducted using a national, stratified sample of new car and light truck purchasers of 1979 model vehicles. All purchases were made during the months of December 1978, and January and February 1979 (N = 1,021).

Variables: Independent: demographics; awareness and recognition of program elements; attitudes toward gasoline supply, price and use; knowledge of factors influencing fuel consumption; attitudes toward various vehicle characteristics.

Dependent: type of vehicle purchased.

Findings/implications: The authors conclude that Transport Canada's fuel consumption information program has attained limited success. Much of the problem appears to result from a limited distribution of program elements (i.e., fuel consumption labels and the Fuel Consumption Guide). Since few respondents recalled seeing these elements, the compliance of car manufacturers and car dealers with Transport Canada's fuel information program is questioned.

While there are many regional differences apparent in the data, vehicle characteristics of particular importance to purchasers include dependability, performance, safety, comfort and fuel economy. The Fuel Consumption Guide appears to have been well received by those purchasers who encountered it. However, a number of respondents indicated that they were not comfortable with the use of metric information.

4024

Klein, Hans Joachim
1982 Changes in Attitudes and Behavioral Structures by Using Solar Energy.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This report focuses attention on the function of the pioneer phase of flat plate solar collector installations in Germany. It describes private experiences in the operation of warm water installations and approaches for the subjective evaluation of their efficiency. Corresponding attitudes and expectations of innovation users are gathered with respect to their roles as technology multipliers. The conclusion is that the actual stagnation of the diffusion of this technology, in spite of obvious deficiencies on the side of handling, private profitableness and social gratification, is due to a manipulated retreat on the industrial supply side.

4026

Klingberg, Tage, and Seymour Warkov
1982 Loans for Energy Conservation in Sweden and Connecticut. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: The barriers/incentives literature examines the role of economic, legal and other incentives in accelerating or retarding the diffusion of new technologies. Loan programs designed to encourage extensive residential energy conservation may be examined as one type of economic incentive for reducing societal dependence on imported petroleum. In this paper, experiences from the State of Connecticut and Sweden are compared with respect to public response to energy conservation home loan programs.

Following a review of selected indicators of geo-climatic conditions, housing stock, household economy, utility organization and public programs for energy conservation in the two study areas, the authors review available research results for Connecticut and Sweden concerning public acceptance of loan programs. Empirical findings bearing on awareness, knowledge, program participation and energy conservation behaviour are assembled. The results are appraised in terms of their contribution to an evaluation of program effectiveness. Several questions are raised that are subject to an ongoing comparative field study in Connecticut and Sweden.

4029

Kobrin, Paul
1981 Fuel Switching, Gasoline Price Controls, and the Leaded-Unleaded Gasoline Price Differential.
Journal of Environmental Economics and Management, 8, 287-302.

Abstract: The Environmental Protection Agency (EPA) and others have opposed gasoline price decontrol, alleging a wider posted price differential between leaded and unleaded grades would result, inducing more motorists to switch illegally to leaded gasoline thereby fouling catalytic converters and increasing air pollution. EPA's model must assume that only the unleaded price ceiling is binding. It is shown that the resulting excess demand is shifted to a close substitute, leaded gasoline. Hence, controls cause more consumption of leaded fuel in new cars (switching) and more pollution. Decontrol would have a palliative effect, contrary to EPA's claim.

Kotowitz, Yehuda 4036

1981 A Pre-Evaluation Assessment of the Energuide Program. Prepared for Consumer and Corporate Affairs Canada.

Abstract: The purpose of the Energuide program is to promote conservation of energy used in major domestic appliances through dissemination of information about energy efficiency. There are several major assumptions underlying the Energuide program, the validity of which this report seeks to evaluate on the basis of available information. The author attempts to identify the information necessary to evaluate the program to date as well as its likely effects in the future under alternative scenarios. A cost-benefit framework for analyzing the program is outlined. Finally, gaps in the current state of knowledge as well as directions for future research are indicated.

4041

Krebsbach-Gnath, Camilla
1982 Energy Shortage: Reaction of the Population, Acceptance Problems and Political Measures.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper examines the impact of various energy shortages and price increases on Western industrial nations. Based on a review of the literature, an evaluation of secondary statistical data and interviews with experts, the author describes the measures taken by government and private-sector industry in response to energy shortages, and the changes which have occurred in the attitudes and behaviour of the general public. Factors affecting public acceptance of energy conservation measures are also discussed.

Kuhn, David J. 4044
1980 The Development and Application of an Energy Opinionnaire. Journal of Environmental Education, 11, 4, 25-28.

Objective: To develop and validate an Energy Opinionnaire through the use of factor analytic procedures.

Method: An original pool of 82 items was administered to 413 high school students from a medium-sized city in the southeastern United States. An SPSS factor analysis program was used to analyze the data.

Variables: The items were derived from another opinionnaire and energy inventory. Five responses could be given to each item, varying from "strongly agree" to "strongly disagree."

Findings/implications: The final version of the Energy Opinionnaire is composed of two subscales and 25 items. The first subscale deals with energy conservation and development, while the second subscale focuses on the public's responsibilities and government controls. The subjects' responses indicate a strong positive pattern of support for energy conservation but ambivalence when energy conservation is related to personal concerns. The reaction to government controls was decidedly negative. The authors conclude that instruments such as the Energy Opinionnaire can help examine attitudes toward energy issues and may provide useful tools for the development and evaluation of energy education programs.

4056

Kushler, Martin C., and John A. Saul
1982 An Evaluation of the Michigan Residential Conservation Service Program: Procedures and Results.
Prepared for the Energy Administration, Michigan Department of Commerce.

Objective: To evaluate the effectiveness of the Michigan Residential Conservation Service (RCS) Program.

Method: The Michigan RCS evaluation includes three essential components: (1) data concerning dwelling characteristics, obtained during the actual home energy audits; (2) demographic, descriptive, attitudinal and self-reported behaviour data obtained during telephone interviews; and (3) actual fuel consumption data obtained from utility company records. The evaluation is based on a quasi-experimental approach featuring elements of both "pre versus post" and "treatment versus control" (matched group) designs. The final sample included 764 audited households and 357 nonaudited households.

Variables: Independent: participation in the program, various demographic variables, dwelling characteristics.

Dependent: energy consumption, various attitudinal and self-reported behaviour measures.

Findings/implications: The results of this first year evaluation indicate that the RCS Program in Michigan has been quite successful. Michigan has completed more RCS home energy audits than any other state. The response of RCS participants, in terms of their opinions and ratings of the program, has been very positive. A detailed survey methodology has indicated that RCS participants report having completed and planned more energy conservation actions than nonparticipants over the same period. Finally, preliminary analyses indicate that RCS participants did make significant reductions in their fuel consumption, weather-adjusted, from the year prior to the year following the RCS audit.

LaBay, Duncan G. 4400
1981 Attitudes of Near-Adopters of Solar Energy: A Public Policy Perspective.
Presented at the 1981 AMA Educators Conference, Washington, D.C., August 9-12.

Objectives: (1) To evaluate the attitudes of a group of aware nonadopters of residential solar energy systems; and (2) to compare them to the attitudes of a similar group of solar energy users.

Method: The data were generated by a mail survey of 420 individuals in the State of Maine. The respondents were comprised of two groups: solar users and aware nonadopters.

Variables: Major variables included attitudes toward seven characteristics of solar energy systems, importance of factors involved in a solar energy system purchase and the assessment by nonadopters of the relative difficulty of converting to solar energy.

Findings/implications: The attitudes and beliefs of solar energy near-adopters concerning various characteristics of solar energy systems are found to differ from those of solar adopters. Near-adopters are distinguished from adopters on the basis of considerably more uncertainty regarding solar energy products. Focusing on the concerns of near-adopters, various public policy means of advancing solar energy adoption are discussed.

4401

LaBay, Duncan G., and Thomas C. Kinnear
1981 Exploring the Consumer Decision Process in the Adoption of Solar Energy Systems.
Journal of Consumer Research, 8, December, 271-278.

Objective: To explore, within a diffusion of innovations framework, the differences between adopters and nonadopters of solar energy systems.

Method: The data were collected through a mail survey of 631 individuals living in Maine. Three subsets were identified: adopters of solar home heating or hot water heating systems, nonadopters who were aware of and knowledgeable about such systems and unknowledgeable nonadopters. The questionnaires were designed to be answered by the household decision maker, either male or female. Various bivariate and multivariate techniques were used to analyze the data.

Variables: Independent: demographics, adopters versus knowledgeable nonadopters versus unknowledgeable nonadopters.

Dependent: adoption of the solar system, perceptions of solar energy systems.

Findings/implications: The adopter is younger, better-educated, higher in income, earlier in the family lifecycle and higher in occupational status than the general population. Very few differences with respect to demographics were found between adopters and knowledgeable nonadopters. Perceptions of the solar energy technology are similar between adopters and knowledgeable nonadopters, and both are different from the general population. In general, with respect to the attribute perceptions, a continuum can be defined with adopters at one end, the general population at the other, and knowledgeable nonadopters in between but generally closer to the adopters. The authors indicate that a reconsideration of traditional adoption models appears necessary to cope with solar energy adoption.

4422

Lawson, Julia, Barbara Kostrewski, and C. Oppenheim
1980 A Bibliometric Study on a New Subject Field: Energy Analysis.
Scientometrics, 2, 3, 227-237.

Abstract: Energy-analysis literature is characterized by a heavy emphasis on English-language journal articles and reports, and, after an initial exponential growth rate, it is now growing more slowly. An examination of article titles demonstrated that even after ten years there is no standard terminology in the area. This casts doubt on the value of searching by title terms for new interdisciplinary subjects. On the other hand, secondary services employing controlled-language indexing were found to index the articles under a variety of headings. In any case, coverage of the subject by secondary services is generally poor. There are no clear core journals for this subject area. Some recommendations are made on how both authors of papers in the field and secondary services can ensure better retrieval of energy-analysis articles.

4431

Lazare, Peter, and Eric Hirst
1981 "Class B" Audits as a Residential Conservation Service Option.
Public Utilities Fortnightly, May 21, 31-36.

Abstract: This article is a culmination of an in-depth study of issues surrounding the "Class B" residential audit which was jointly conducted by the Minnesota Department of Public Service and the Minnesota Energy Agency. The "Class B" energy audit is a form of residential energy conservation service which may be offered by energy utilities in compliance with provisions of the National Energy Conservation Policy Act. Residents themselves supply the necessary information to determine the conservation needs of their homes rather than having trained professionals perform such work -- a kind of do-it-yourself energy audit. This article reports upon a "Class B" residential audit as conducted by customers of Northern States Power Company and a follow-up investigation of its results and effectiveness under the auspices of the two state agencies named above.

4432

Lee, Henry
1982

A. Energy at the State and Local Level: An Evolving Perspective (Discussion Paper Series, no. E-82-06).
B. Energy at the State and Local Level: Allocating Responsibility (Discussion Paper Series, no. E-82-07).
Cambridge, Mass.: Energy and Environmental Policy Centre, John F. Kennedy School of Government, Harvard University.

Abstract: This report is divided into two volumes. The first explores the evolution of state and local programs in the 1970s and the factors which shaped the evolutionary process. Five factors in particular are analyzed: (1) perception of the relative seriousness of the energy problem; (2) the availability of federal monies; (3) the presence of a legislatively established energy program and the time frame in which it was established; (4) the importance of the consumer and environmental movements; and (5) the fiscal capability of the states. The effects of recent changes in federal policies on state and local energy programs are assessed in light of these five factors.

The second volume assesses the relationship between state and local energy programs. It explores the comparative ability of each to develop and deliver energy functions, and sets forth criteria for allocating responsibilities for these functions between the two levels of government. Five alternative models for improved state/local cooperation are explored and recommendations are set forth.

4433

Lee, Martin E.H., and Matthew F. Glover
1980 Use of Disaggregate Data to Evaluate Gasoline Conservation Policies: Smaller Cars and Car Pooling. Transportation Research Record, 764, 16-23.

Abstract: A microdata base of vehicle ownership and use characteristics was built from 7,581 interviews of Michigan driver's licence renewal applicants in 1976. Analyses of gasoline efficiency in occupant kilometres per litre suggested that the greatest potential for conservation policy was to be found in commuter carpooling and a shift to smaller cars. Six scenarios for carpooling and smaller cars were defined in sufficient detail to exclude types of trips or classes of vehicle users for which these policies would present significant difficulties. The scenarios were run against the 1976 data to calculate the gasoline savings and improvements in occupant kilometres per litre obtainable in the best case. Smaller reductions in litres were found than would be predicted from gross estimates, but considerable consistency emerged in the pattern of hypothetical responses of different subgroups of drivers distinguished by income or the urbanization of their home area, despite large differences in gasoline consumption. It is suggested that suburban drivers could provide 25% more gasoline savings that the statewide per capita average, under the most optimistic scenarios analyzed. It is also suggested that the microdata techniques be calibrated to externally measured behavioural data on travel and conservation choices.

Lee, William C. 4434

1980 Demand for Travel and the Gasoline Crisis. Transportation Research Record, 764, 38-42.

Abstract: This paper uses traffic count data to estimate and analyze the demand for gasoline and different kinds of work and leisure travel in California from 1970 to 1975. Empirical results of the ordinary least squares regressions show the price elasticity of gasoline and travel to be quite inelastic, between -0.05 and -0.50. The income elasticities range between 0.5 and 1.5. Furthermore, the results suggest that leisure-oriented travel is less price- and income-sensitive than work-oriented travel. Results also indicate that travel and gasoline are affected by seasonal variations. In addition to the conventional demand analysis, the study investigates the gasoline crisis in California in 1974. During the gasoline crisis, the existence of queuing at service stations suggested that disequilibrium existed in the gasoline market. Due to the difficulty in purchasing gasoline, the true price of gasoline exceeded the actual price paid at the pump. Results show that the true price of gasoline rose from a precrisis price of $0.31/gal. to more than $1.00/gal. in some instances during the height of the crisis in March 1974. Furthermore, the value that would have been transferred from consumers of gasoline to suppliers was approximately $355 million. This amount, which averages about $27 per licensed California driver, could be thought of as a measure of the gross welfare loss of gasoline rationing.

4436

Leonard-Barton, Dorothy
1982 The Public Acceptance of Decentralized Technologies: The Case of Residential Solar Equipment.
In G. Enk and W. Hornick, eds., The Social Impacts of Decentralized Energy Systems, forthcoming.

Abstract: The acceptance of a new technology is often presented as a function of simple economics: when the price is right, the public will buy. While not denying the importance of economics in the diffusion of innovations, the author argues that there is more to the process than simple payback calculations. Psychological and social processes also influence market penetration. This paper presents a conceptual framework for considering the spread of a new technology. Some aspects of the framework are illustrated with data gathered in two studies of public acceptance of residential solar equipment in California.

4437

Leonard-Barton, Dorothy
1981 Voluntary Simplicity Lifestyles and Energy Conservation. Journal of Consumer Research, 8, December, 243-252.

Abstract: This paper provides a means of measuring individuals' tendencies towards a lifestyle of voluntary simplicity. This lifestyle involves increased ecological awareness, attempts to become more self-sufficient and efforts to decrease personal consumption of goods. The paper reports on the historic background and development of the index that is used to measure voluntary simplicity, the characteristics of those who engage in voluntary simplicity and, finally, the relationship of the index to energy-conserving behaviours. The author defines voluntary simplicity "as the degree to which an individual selects a lifestyle intended to maximize his/her direct control over daily activities and to minimize his/her consumption and dependency." The emphasis of the definition is on voluntary effort. In general it was found that voluntary simplicity was negatively related to age, unrelated to income and somewhat positively related to education. There was no strong predictive relationship between race and voluntary simplicity. There is a relationship between mechanical ability and voluntary simplicity. The author concludes that many voluntary simplicity behaviours are related to a reduction in energy consumption.

4446

Leonard-Barton, Dorothy, and Everett M. Rogers
1979 Adoption of Energy Conservation Among California Homeowners. Institute for Communication Research, Stanford University, Stanford, Calif.
Presented at the International Communication Association, Philadelphia, May 1-5, 1979.

Objective: To determine those variables which were both important in the respondents' decisions whether or not to conserve gas in their homes and were also susceptible to influence through communication campaigns.

Method: In the spring of 1978, just as California was emerging from one of the worst droughts in its history, 215 Palo Alto homeowners were interviewed about their views on energy and water conservation, and about the extent to which they had adopted 11 energy-conserving practices in their homes.

Variables: Independent: demographics, capacity to retrofit, various attitude and belief measures of a general and energy-specific nature.

Dependent: actual gas consumption, self-reports of adoption of conservation practices.

Findings/implications: House structure accounted for 29% of the variance in actual gas usage, as measured by utility records over a 12-month period. Adoption of the 11 energy-conserving practices chosen for study explained 99% of the remaining unexplained variance in gas usage. Adoption levels were predicted by the homeowner's assessment of the personal consequences of adopting each conservation strategy, by ability to make home repairs, by past experience with shortages and by awareness of a social norm or conservation ethic. The authors conclude that very practical and specific "how to" information is needed in the promotion of energy conservation, rather than persuasive communication aimed at changing general energy-related beliefs. They suggest that neighbourhood information networks could prove to be effective channels for the diffusion of energy-conserving practices.

4449

Levin, Irwin P., and Morris J. Gray
1979 Evaluation of Interpersonal Influences in the Formation and Promotion of Carpools.
The Institute of Urban and Regional Research, The University of Iowa. Paper presented at the meetings of the Transportation Research Board, Washington, D.C., January 1979.

Abstract: This paper describes a research program at the University of Iowa involving a three-phase analysis of the role of interpersonal factors in carpooling. Phase 1 utilized laboratory simulation methods in which respondents rated the relative desirability of alternative carpool descriptions. The main finding was that carpooling decreased in desirability as the number of nonacquaintances in the pool increased, with particularly low ratings being given to carpools composed entirely of nonacquaintances. Phase 2 consisted of an analysis of attitudinal and behavioural data from an existing industry-based carpool promotional program using FHWA matching techniques. Survey data obtained from 1,325 employees confirmed the importance of acquaintanceship as a factor in carpooling. Thirty-five per cent were carpooling. However, only 15% of these carpoolers were unacquainted with their fellow carpoolers before the pools were formed, and most carpools were apparently formed on the basis of informal acquaintanceship networks. Of the noncarpoolers who expressed an interest in carpooling, the primary reason for not having joined a carpool was lack of personal contact with other potential carpoolers. Phase 3 utilizes the findings from Phases 1 and 2 as a basis for designing and implementing promising strategies for promoting carpooling. In particular, strategies are proposed that stress person-to-person contact between potential carpoolers and utilize existing acquaintanceship networks to increase the number of carpools. Evaluation of such strategies should be useful in formulating future carpool promotional programs.

4464

Lundstrom, Erik

1982 Energy Consumption in Single-Family Houses -- Influence of the Occupants.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To provide an explanatory model for total energy consumption in electrically heated single-family houses.

Method: The study is based on 78 similar houses, electrically heated, built as one group in 1969. Data have been collected for a ten-year period from publicly available socioeconomic records on individual occupants and houses in Sweden.

Variables: Independent: climate; technological factors such as insulation, the ventilation system and the heating system; behavioural factors such as family size and income, indoor temperature, airing habits, etc.

Dependent: total electrical energy consumption.

Findings/implications: An earlier study based on 3,200 houses, divided into 93 groups of similar design, has shown that energy consumption for one house may be twice that of another house in the same area, built to an identical design. The problem is, How much of this scatter depends on occupancy behaviour?

The explanatory ability of the model turns out to be low. Only about 20% of the total spread in electricity consumption between households can be accounted for by the model. On the other hand, it has been found that half the spread in electricity consumption between households can be explained by total hot and cold water consumption.

4468

Luyben, Paul D.
1982 Prompting Thermostat Setting Behavior: Public Response to a Presidential Appeal for Conservation.
Environment and Behavior, 14, 1, 113-128.

Objective: To assess the extent to which citizens will alter energy-consuming behaviour in response to antecedent stimuli, in this case the natural gas shortage of the winter of 1977 plus President Carter's appeal to citizens to turn their thermostats back to 65° F.

Method: Two surveys, a door-to-door survey and a telephone survey, were conducted in a small (25,000 population), central New York State city. A total of 101 door-to-door interviews and 168 telephone interviews were completed.

Variables: Independent: demographics, energy conservation prompts.

Dependent: energy conservation related attitudes, thermostat setting.

Findings/implications: Only 27% of households had their thermostats set to 65° F or lower. Those who heard President Carter's appeal were not significantly different from those who did not. Reports of thermostat settings were significantly lower than observed settings. Indirect evidence suggested that citizens made only limited readjustments in thermostat settings as a result of the gas crisis. Attitudes and knowledge appear to be independent of actual behaviour. Higher fuel bills did not appear to have an impact on temperature setting.

4469

Luyben, Paul D.
1980-81 Effects of a Presidential Prompt on Energy Conservation in College Classrooms.
Journal of Environment Systems, 10, 1, 17-25.

Objective: To assess the effects of a procedure designed to reduce the unnecessary use of lighting in college classrooms.

Method: A high-salience prompt, in the form of a letter personally signed by the President of the College, was sent to each of ten professors who taught prior to an unscheduled period. The letter informed the professor that he or she taught prior to an unscheduled class and requested assistance in turning off the lights. A multiple baseline design was used.

Variables: Independent: treatment.

Dependent: faculty response.

Findings/implications: The results showed a 39% increase in lights turned off after the prompt. The significance of this finding is discussed, and subsequent research, in terms of determining the actual energy savings achieved through the use of such procedures, is suggested.

4472

Lysonski, Steven
1982 Technology Transfer to the Household: The Cost of an Energy Conserving Innovation.
New England Journal of Business and Economics, 9, 1, 58-73.

Objective: To examine the characteristics of adopters who recently purchased a thermally activated vent damper for their gas furnace.

Method: A questionnaire was mailed to 180 purchasers of the vent damper, resulting in a useable sample of 84 individuals (46.7% response rate). Although the majority of the sample were from Rhode Island, some respondents were residents of Massachusetts and Connecticut. The theoretical basis for this study is largely derived from the literature on adoption and diffusion.

Variables: Various attitudinal variables; demographics; communication sources related to awareness and purchase of the device; other variables related to purchase-timing; expected savings from the device; reason for purchase; etc.

Findings/implications: The results suggest that adopters of the vent damper come from the higher socioeconomic levels of society and portray certain characteristics such as self-confidence, a strong interest in home energy products and a willingness to experiment with energy products about which they are uncertain. Therefore, methods to reach individuals who are in lower socioeconomic groups and have different characteristics may be needed.

The findings also indicate that personal sources of communication are much more instrumental in promoting awareness of energy-related products than are more formal communication sources. Further, 80% of the sample indicated that they bought the vent damper to save money on their fuel bill. Policy implications, as well as suggestions for further research, are presented.

4811

Martyn, John
1982 Research into Households' Use of Fuels in Great Britain. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper deals with the Electricity Council's use of market research in its load forecasting and energy marketing. It describes how research is used to estimate the contributions made by each major class of customer and explains changes in the level and shape of household demand for electricity.

Considerable importance is attached to ascertaining the levels of ownership of major fuel-consuming appliances. This knowledge is updated each year and is used to estimate total household electricity consumption. The required appliance ownership and acquisition data are obtained mainly from the AGB Home Audit service.

The paper closes with an account of research showing the use of electric and gas cooking, heating and water-heating equipment at different times of the day. The author concludes that an improved knowledge of how households use this equipment is necessary for the design of more energy-efficient appliances and the formulation of a sound energy policy.

4812

Mathews, Stephanie A., Stephen B. Fawcett, Russell G. Winn, and R. Mark Matthews

1982 An Empirical Strategy for Identifying Residential Energy Conservation Techniques.
Journal of Environmental Systems, 11, 14, 295-306.

Objective: To conduct a social validation of residential energy conservation techniques by polling individuals with special expertise in the area.

Method: Questionnaires were mailed to 98 energy conservation "experts"; 44 completed questionnaires were returned. Each participant was asked to rate the importance of each of 201 different energy conservation techniques.

Variables: Independent: energy conservation technique.

Dependent: rating of importance as an energy conservation method.

Findings/implications: Seventy-four specific conservation activities were considered by the experts to be very important. Further, of the 74 techniques, none was rated as being very commonly used by consumers. Space heating and cooling is a most important area of energy conservation, but every area has at least two important individual conservation techniques. The authors conclude that the rating data may be helpful in designing educational programs or information systems. Also the data may assist researchers in selecting targets for future study.

4813

Mayer, Joni, and E. Scott Geller
1982 Motivating Energy Efficient Travel: A Community-Based Intervention for Encouraging Biking.
Journal of Environmental Systems, in press.

Objective: To evaluate the effectiveness of a practical incentive strategy for increasing biking and walking on a community bicycle path.

Method: During a three-week baseline period, frequencies of biking and walking were observed on two bikeways in a university setting. Then an incentive intervention with an innovative scheme for preventing cheating or circumvention was implemented at one of these pathways for a three-week period, followed by a three-week withdrawal period. The incentive phase was announced in local newspapers and in distributed handbills.

Variables: Independent: walking or bicycling as a mode of transportation, a contest to encourage use of the experimental bike path, various prompting strategies to inform the public about the contest.

Dependent: use of the experimental bike path.

Findings/implications: During the incentive period, biking frequency on the experimental bike path was significantly greater than during pre- and postincentive conditions, relative to observed biking on the control bikeway. Further, the pattern of daily biking frequencies during the incentive phase indicated that the increase in biking was directly related to the administration of certain prompting procedures. The cost-effectiveness of the behavioural intervention is discussed with reference to communitywide application.

4814

Mayer, Lawrence S., and Cynthia E. Horowitz
1979 The Effect of Price on the Residential Demand for Electricity: A Statistical Study.
Energy, 4, 87-99.

Abstract: The statistics of the demand for electricity and the relationship between the price of electricity and the demand for it are examined through analysis of the monthly consumption statistics of a community of owner-occupied town houses. The average yearly demand for electricity grew from 1971 to 1973 and then decreased by less than 2% per year for the next three years. In spite of price increases, demand for electricity during the heating season (the units are heated by a forced air natural gas furnace) increased steadily but slightly over the six years of observation. A simple statistical model is used to split the cooling season demand for electricity into air conditioner demand and the demand for lights and appliances. The noncooling portion of demand decreased from 1974 to 1976, but otherwise increased each year from 1971 to 1976. The estimated portion of demand that is used for cooling appears to have increased between 1971 and 1974 and then decreased between 1974 and 1976. The evolution of the electricity-rate schedule for this community is considered and then two simple statistical models, which relate demand to price, are estimated. These indicate that, although the marginal price has doubled (in current dollars), these changes in price have had little effect on demand.

4816

McClelland, Lou
1982 Energy Efficiency in the Rental Housing Market.
Presented at the 1982 Summer Study of the American Council for an Energy-Efficient Economy, Santa Cruz, Calif., August.

Abstract: Energy use in rental housing is determined by the actions of both tenants and building owners/managers. In contrast, the financial incentive for improving energy efficiency is usually seen as one-sided, residing either with tenants when they pay for energy separately from rents or with the owner when energy costs are included in rents. Tenants and owners can share the financial benefits of energy efficiency when tenants pay energy bills but value low energy costs enough to give a competitive edge to efficient properties. Four aspects of this phenomenon are examined using data from a study of rental advertising in 32 cities nationwide and from a case study of 69 properties in Atlanta: (1) tenant intentions to consider energy costs in the rental decision, measured by inquiries about energy costs from prospective tenants; (2) mention of energy efficiency and costs in advertising for rental housing; (3) sensitivity of rents to energy costs and features; and (4) owner actions to reduce tenant-paid energy costs.

4819

McClelland, Lou
1982 Short-Term Effects of Tenant Payment of Utilities on Energy Use in Multifamily Housing.
Presented at the 1982 Summer Study of the American Council for an Energy-Efficient Economy, Santa Cruz, Calif., August.

Abstract: Although it has long been acknowledged that tenants of rental housing use energy more wisely when they pay energy costs separately from rent, most estimates of the magnitude of this effect are based on work completed before 1978 and focusing solely on electricity. This paper:

(1) describes the trend toward tenant payment of energy costs seen in multifamily rental housing in recent years;

(2) briefly reviews past estimates of the change in energy use associated with the introduction of tenant payments;

(3) describes sampling and analysis methods used in a major effort to update these estimates;

(4) presents results for a preliminary set of 15 properties which introduced tenant payment during the period 1979-82, with tenant charges based on metered heat use or on square feet occupied; and

(5) outlines how the results will be extended with additional analyses, comparisons to control properties, and an examination of the effect of tenant payment on actions of property owners to maintain and improve the energy efficiency of structures and equipment.

4843

McDougall, Gordon H.G., John D. Claxton, and J.R. Brent Ritchie
1982 The Formulation of Consumer Energy Policy in Canada: Professional and Consumer Perspectives.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: The Canadian government has recognized the need for programs which accelerate consumer energy conservation efforts. A major concern in these efforts is the identification of conservation programs which achieve this goal most effectively and most efficiently.

This paper addresses the above issue by presenting the results of a study which examined a range of policy options with the goal of providing a better understanding of which type of conservation programs are most likely to succeed. The unique characteristic of the study was the use of inputs from experts responsible for program design and from consumers upon whom such programs will ultimately impact.

The research consisted of three distinct phases. Phase I involved exploratory interviews with North American professionals in the field of energy conservation, with a view to identifying and classifying existing or proposed programs. Thirty-four typical programs were then selected for inclusion in an Annotated Directory of Energy Conservation Programs. In Phase II of the study, these programs were submitted to a panel of 29 professionals in Canada, who were requested to assess each program in terms of its perceived effectiveness and overall desirability for achieving consumer energy conservation. The ten most highly rated programs from the survey of professionals were subsequently assessed by a national consumer panel (N = 1,433) in terms of their importance for energy conservation and their acceptability to consumers. In addition, consumers were asked to indicate which characteristics of conservation programs they considered to be generally most desirable. The sample of consumers studied was drawn from the same national panel of Canadian households that had been employed two years earlier in a study of energy consumption and conservation patterns.

4844

McDougall, Gordon H.G., John D. Claxton, J.R. Brent Ritchie, and C. Dennis Anderson
1981 Consumer Energy Research: A Review.
Journal of Consumer Research, 8, December, 343-354.

__Abstract__: This paper provides an overview of the path taken in consumer energy research in the past decade. The authors categorize energy research in terms of recent trends, review some of the theoretical research on the patterns of energy consumption and conservation, review some more applied examples of research on specific conservation initiatives, and discuss directions for future consumer energy research. The authors segment consumer energy research into studies focused primarily on understanding consumers (e.g., what consumers are thinking and doing about energy conservation) and studies on the impact of energy-consumption initiatives. The research stream focused primarily on understanding consumers is subdivided into opinion research, self-reported energy conservation behaviour surveys, adoption/diffusion research and modelling of energy consumption. The second stream dealing with energy conservation initiatives is subdivided into studies of various information initiatives, various incentive initiatives, various disincentive initiatives and various restriction initiatives. A review of the literature indicates that consumer energy research is burgeoning. Research dealing with understanding consumers has been more prevalent than research on conservation initiatives, and research focused on understanding consumers has been primarily opinion research, although trends suggest a "maturing of the field." There has also been an increase in the number of consumption modelling studies. In addition, recent research indicates an increased appreciation for the complexity of the area. This review also provides a discussion of heavily researched areas, as well as shortcomings in the existing consumer energy research literature. These shortcomings include the apparent mismatch between conservation initiatives and research directions, gaps in the understanding of consumers, gaps in the assessment of conservation initiatives and, finally, several research method concerns.

4858

McDougall, Gordon H.G., and Randolf B. Mank
1982 Consumer Energy Conservation Policy in Canada: Behavioral and Institutional Obstacles.
Energy Policy, September, 212-224.

Objectives: (1) To identify behavioural/attitudinal and institutional obstacles which need to be overcome if energy conservation policy is to succeed in Canada; and (2) to link policy types with the obstacles which they are most likely to encounter and thus to underline the need for program implementation strategies which anticipate specific obstacles.

Method: The data on behavioural obstacles were generated through a national survey of over 2,000 Canadian households. The results of a series of interviews with officials from industry and federal and provincial governments identified the major structural obstacles to energy policy formulation and implementation at the federal level in Canada.

Variables: In the Canadian consumer survey, major variables included situational, demographic, attitudinal, energy consumption and conservation measures. The interviews focused on current energy conservation programs, evaluation studies of these programs, proposed programs and institutional obstacles to energy policy formulation and implementation.

Findings/implications: Residential energy conservation policies face behavioural barriers, such as consumer resistance to policies that affect lifestyle, and institutional barriers, such as weak federal-provincial relations. Viewed from a federal perspective, these obstacles are discussed and then linked to policy types. A prior understanding of the obstacles which a particular program type is likely to face should allow more effective execution of the program and enhance the probability of success.

4862

McDougall, Gordon H.G., and J.R. Brent Ritchie
1983 Consumer Energy Conservation: A Framework for Policy Research.
Prepared for Consumer and Corporate Affairs Canada.

Abstract: The development of policy in the consumer energy conservation field is a complex issue. The number of options available to reduce consumer energy consumption is immense. Frameworks and structures are required to add clarity to the situation and to assist in identifying and implementing those options which are effective and fair. This paper suggests such a framework, which should be of value to researchers and decision makers in the field. Three elements should be considered: the payoff matrix, the policy process and policy types. This article describes each element and demonstrates that through an understanding of all three, options can be enumerated, ranked, evaluated and selected for implementation. Consumer research has an important role to play in each step of the process.

4878

Midden, Cees J.H., and Beatrijs S.M. Ritsema
1982 The Meaning of Normative Processes for Energy Conservation. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To analyze the influence of informal normative processes on energy conservation intentions and behaviour.

Method: The analysis is based on data generated from a national survey on energy conservation in family households conducted in the Netherlands in 1981. A questionnaire was administered to a representative sample of the Dutch population (N = 1,076).

Variables: Various socioeconomic and demographic variables, measures of subjective norms, measures of the perceived influence of various categories of others on conservation behaviour, energy conservation intentions.

Findings/implications: The results indicate that the impact of subjective norms on intentions and behaviour is limited and not a good basis for change activities. Factors such as defining the target audience and monitoring and sanctioning relevant behaviour could be used to improve the impact of normative influence. Different socioeconomic groups, for example, require different strategies. The authors conclude that in assessing the success of small-scale approaches for encouraging conservation behaviour, factors such as the effective diffusion of information may be more important than normative influence. This should be taken into account in designing community programs.

The strong potential of the nuclear family for influencing conservation behaviour is discussed.

Monnier, Eric 4895
1982 Energy Inputs and Household Behavior in France.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: In order to understand the relationships which exist between contemporary ways of life in France and the global consumption of energy, it is necessary to consider both the energy directly consumed within the home and that which enters the house through manufactured goods. The trade-off between these two forms of energy consumption has grown continuously over the past 20 years.

People living in similar conditions may have quite different behaviour patterns because of the impact of cultural and symbolic dimensions.

In this paper, modes of energy consumption are discussed in a dynamic model in which the current social position of the household, and its previous experience and future expectations, are determining factors. Understanding the energy dependence of different ways of life, or the capacity of households to modify their energy consumption, implies the analysis of the specific social and residential trajectories of each sociocultural group.

4901

Montag, Geraldine M., and George E. Lamp
1981 Energy Conservation Evaluation: Rate of Return vs. the Present Worth Method of Life Cycle Costing.
Ashrae Journal, 11, 52-55.

Abstract: The present worth and annual equivalent methods of life cycle costing can give a different ranking of independent energy-savings measures than that obtained from the rate of return method. This inconsistency is a result of different assumptions made in the reinvestment of funds covered during the life of a measure. All things considered, the rate of return analysis is considered the more realistic approach.

Morell, David 4906
1981 Energy Conservation and Public Policy: If It's Such a Good Idea, Why Don't We Do More of It?
Journal of Social Issues, 37, 2, 8-30.

Abstract: Many observers of America's growing energy problem during the 1970s have emphasized the critical role of more efficient use of available energy supplies. Yet national energy policy continues to neglect conservation in favour of measures to increase supplies, especially electrification. Political and social factors help explain this anomaly. Supply-oriented policies are compatible with basic American myths; conservation is seen as antithetical. Energy users are reluctant to take action alone, preferring instead to wait for leadership on what they see as a national problem. Many feel that technology introduced by others will solve the problem for them, without any need for difficult personal efforts. Energy companies and government bureaucracies both have vested interests in continued pursuit of supply strategies; to them, conservation is a diversion from their fundamental institutional rationale. While response to increased prices has been evident, it has been modest even in 1980. Personal comfort, convenience and safety have all taken precedence over individuals' energy-conserving behaviour. To succeed, energy conservation policies must eliminate or neutralize several significant institutional and regulatory impediments. This phenomenon is explored through an examination of the importance of rate base considerations to electric and gas utilities, and of cogeneration of electricity with industrial process steam. In the broader political context, energy conservation is seen as a challenge to the American political system. While energy supply increases seem to require decisions by only a few corporate or government officials, pursuit of this approach eventually will lead to greater polarization and conflict between organized groups, economic sectors and geographic regions. Coping with the energy crisis will require the effective involvement of the millions of individual decision makers who are citizens as well as energy users.

4907

Morgenstern, Richard D., and Rober Dubinsky
1982 Residential Conservation in the Eighties: Promising Private Initiatives.
Environment, 24, 1, 8-13, 31-32.

Abstract: This paper focuses on conservation and, in particular, on some promising new private sector institutional arrangements designed to overcome existing barriers and encourage conservation in the residential sector. The basic problem is that the relevant decision makers may not be receiving the appropriate market signals. If they are receiving the appropriate signals, they may be ill-equipped to take action. In either case, optimal investments are not being made, and society is being deprived of the benefits potentially available from a more rapid and efficient reaction to market realities. The article discusses two approaches to residential energy conservation: the potential involvement of electric utilities in the promotion and marketing of conservation, and the role which energy management companies could play in selling energy services to building owners.

4908

Morrison, Peter A.
1979 Demographic Trends Impinging on Energy Use.
In Charles T. Unself et al., Sociopolitical Effects of Energy Use and Policy. Supporting paper no. 5, Committee on Nuclear and Alternative Energy Systems, National Research Council. Washington, D.C.: National Academy of Sciences.

Abstract: The use of energy and policies intended to affect its availability are woven into a broad socioeconomic context. Demographic shifts compose one part of this context and are more readily measured and understood than other elements. These shifts include changes in the size, structure, composition and spatial distribution of energy-consuming units (households and families, most notably). This paper lays out this context of demographic change and points toward its possible linkages with energy use.

Several demographic trends are identified under each of the following topic areas: patterns of growth in energy-consuming units, growth of multiworker families, and changing patterns of population settlement. The author points out that, while demographic shifts can be delineated with precision and forecast with confidence, understanding how these changes will interact with energy availability to shape future emerging patterns is far less exact.

4916

Murray, James R., Michael J. Minor, Norman M. Bradburn, Robert F. Cotterman, Martin Frankel, and Alan E. Pisarski
1974 Evaluation of Public Response to the Energy Crisis. Science, 184, April, 257-263.

Objective: To report some of the major findings of the Continuous National Survey (CNS) concerning public exposure and reaction to the energy crisis of November 1973.

Method: The CNS, a small, weekly, nationwide probability sample of the U.S. population, was used to generate data on several energy-related attitudes.

Variables: Independent: demographics.

Dependent: attitudes.

Findings/implications: While a majority of the public considered the energy shortage to be a serious problem, only about 25% perceived it as the most important problem confronting the United States. There was very little support evidenced for gasoline rationing. The majority of the blame for the crisis was placed on the federal government and the oil companies. Generally, respondents indicated they felt restricted in the amount they could use their automobiles. Two-thirds felt that individuals could play a major role in solving the fuel shortage. Opinions about the energy shortage were not found to be significantly related to region, education, income or area of residence. Priorities for fuel allocation were found to be very similar to the government's allocation plans.

5200

National Assessment of Educational Progress
1978 Energy-Knowledge and Attitudes: A National Assessment of Energy Awareness Among Young Adults.
Report no. 08-E-01. Denver, Colo.: Education Commission of the States.

Objective: To gather information on the energy-related knowledge and attitudes of Americans between the ages of 26 and 35.

Method: A national probability sample of young adults born between January 1941 and December 1950 was drawn. The sample was stratified by region and community size (N = 1,300).

Variables: Independent: demographics.

Dependent: knowledge of: (1) basic energy facts, (2) general energy issues, and (3) energy conservation; and attitudes toward: (1) the seriousness of energy problems, (2) the effectiveness of personal action, (3) environmental hazards, and (4) energy trade-offs.

Findings/implications: Generally, young adults were familiar with energy-related terminology and some practical conservation techniques that reduce energy consumption in transportation and in the home. Where knowledge of deeper issues, such as conversion processes, imbalances between supply and demand, and energy reserves, is concerned, the level of knowledge was lower. Attitudinal measures indicate that: the majority of respondents do believe the energy problem is serious; respondents are influenced by energy concerns when purchasing automobiles and appliances, making work-related travel decisions and when voting; and wars probably will occur over energy supply and use. While the majority indicated a desire for more information about energy problems and conservation, over one-third of the respondents also seemed to doubt that their personal actions could influence external agents such as governments, manufacturers and oil companies. Responses to a series of questions about preferences, or environmental protection versus energy development, indicate strong support for environmental protection. Some educational implications of the results of the survey are suggested.

5207

National Research Council
1980 Behavioral and Social Responses to Energy Issues.
Washington, D.C.: National Research Council.

Abstract: While acknowledging that the methods and assumptions of economics will continue to play a major role in the development of energy-supply strategies, this brief article emphasizes the contributions which behavioural and social sciences can make to the development and analysis of alternative energy policies. Four areas of contribution are identified: increasing the accuracy of predictions of responses to economic incentives, increasing our knowledge of behavioural changes in response to factors other than economic self-interest, increasing the capacity of the public to choose among new and existing technologies, and anticipating the consequences of alternative energy policies. To illustrate how knowledge in the behavioural and social sciences can be applied to these four areas, some recent examples of research are described.

5214

Nelson, Lorne W., and Thomas Becky
1982 Computer Predictions and Test Verification of Cooling Energy Savings with Thermostat Setup.
Ashrae Journal, January, 44-48.

Objectives: (1) To determine the effectiveness of thermostat setup as a method of saving energy during the cooling season; and (2) to test the credibility of computer simulation as a means of predicting energy savings.

Method: Extensive residence field tests and a variety of computer studies were conducted.

Variables: Field tests: indoor and outdoor temperatures; compressor hours (cooling energy measure); total gas and electricity consumption.

Computer studies: A hybrid computer model was used to determine the actual cost of energy requirements for different potential setup schedules for a four-person family. To determine the degree of comfort and/or discomfort to the occupants using different setup schedules, a six-factor comfort model was applied.

Findings/implications: With a reasonably sized air conditioning unit, people can expect both energy savings and comfort using thermostat setup in the cooling season. Setting the thermostat up at night and during the day (dual setup) provides significantly more energy savings compared to a single setup period. Setup schedules that maximize energy savings and comfort for different lifestyles are recommended. Computer simulation results based on thermostat setup schedules agree with the results obtained from actual family residences. This is true regardless of varying house sizes and air conditioner capacities. The results confirm that computer simulation is a valid means of predicting energy savings for different structures in different locations.

5236

Newman, Keith A.
1982 Human Values: Do They Make a Difference in Individuals' Commitment to Energy Conservation?
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To examine the role which values play in people's commitment to energy conservation.

Method: The analysis is based on data collected from an in-depth survey of 376 households in three cities in Southern California. A mixture of interview and self-administered formats was used.

Variables: Independent: demographic variables, value ratings, beliefs about conservation and the energy situation, dwelling characteristics, commitment to conservation among significant others, knowledge of conservation services.

Dependent: behavioural commitment to conservation.

Findings/implications: The results indicate that a number of values, particularly those pertaining to environmental quality and personal growth, are weakly related to both conservation behaviour and beliefs pertaining to the efficacy and necessity of conservation. Values influence behavioural commitment independently of personal and contextual factors, but do not predict such behaviour above and beyond these other factors. It is concluded that personal values do not constitute a significant obstacle to the public's conservation efforts, and that greater emphasis should be placed on providing services that enhance the public's opportunities for channelling their willingness to conserve into concrete action.

5237

Neveu, Alfred J.
1981 The Sensitivity of Work and Non-Work Travel to Energy Shortages or Price Rises.
Report no. 201. Albany, N.Y.: New York State Department of Transportation.

Objective: To analyze the sensitivity of work and nonwork travel to fuel supply and price changes so that more effective and equitable conservation programs can be developed.

Method: Telephone interviews were conducted with a stratified sample of 1,560 adults in New York State to determine their present (October 1980) conservation behaviour with respect to the fuel situation.

Variables: Major variables include past conservation behaviours, behavioral intentions under an alternative energy future and demographic characteristics.

Findings/implications: While many respondents highlighted actions which emphasized nonwork travel as the prime conservation mechanism used, a very different response pattern emerges when conservation actions are transformed into implied energy savings. Car-purchasing actions account for the largest share of the fuel savings, with work and nonwork travel about equal. When these savings were apportioned into strictly work and nonwork categories, it was found that work travel bears a slightly larger portion of the total savings (40%) than its share of travel (35%) would seem to indicate. Estimates of elasticities of work and nonwork travel to energy supply and price also support this finding.

5238

New York State Energy Office
1981 Evaluation of the Oil Heat Efficiency Program.
Albany, N.Y.: New York State Energy Office.

Objectives: The overall purpose of the study was to determine how successful the Oil Heat Efficiency Program was in motivating customers to make the suggested oil heat modifications and save energy. More specifically, the research objectives included determining the extent to which the program motivated consumers to have an energy efficiency test (EET) performed on their house, and the level of consumer implementation of the recommended actions to estimate the energy saved as a result of the program.

Method: The study involved interviews with 861 home-heating oil customers who resided in one- to four-family dwellings in New York State. Data were collected through telephone interviews using the random digit dialing technique.

Variables: Independent: exposure to information on how to conserve oil, had the EET performed, energy conservation behaviour.

Dependent: had the EET performed, energy conservation behaviour, satisfaction with improvements.

Findings/implications: The total estimated annual energy savings attributable to the program were approximately 10.5 million gallons of home heating oil valued at $12.5 million. The value of the savings in comparison to the cost of administration ($127,000) resulted in a program cost-effectiveness ratio of 99 to 1. Individual homeowners that made at least one recommended modification saved between 100 and 320 gallons of oil annually. Pamphlet recipients who were exposed to advertising for a longer period were more likely to have an energy efficiency test performed than were pamphlet recipients who were exposed to advertising for a shorter period of time.

5239

New York State Energy Office
1981 Evaluation of the Multi-Family Housing Energy Conservation Program.
Albany, N.Y.: New York State Energy Office.

Objectives: (1) To evaluate the effectiveness of the training seminars in encouraging energy conservation; (2) to evaluate the effectiveness of the workbooks in encouraging energy conservation; (3) to determine the energy conservation actions taken as a result of the program; and (4) to estimate the energy savings resulting from the program.

Method: Data for the study were collected in telephone interviews with building owners, managers and superintendents representing building management organizations. Successful contacts were made with 482 individuals during January 1981.

Variables: Independent: received workbooks by mail, received workbooks at seminar.

Dependent: implemented an energy conservation action.

Findings/implications: Actions taken by program participants, through October 1980, resulted in annual savings equivalent to approximately 33 million gallons of home-heating fuel worth about $42 million. About one-half of this total would not have been saved without the program. The program cost-effectiveness ratio is approximately 108 to 1. Additionally, program participants were found to have saved an average of $3,000 per apartment building. The seminars stimulated the use of the workbooks.

5400

Northern States Power Company
1982 1981 Home Use Study: NSP System.
Minneapolis, Minn.: Northern States Power Company.

Abstract: This study, based on a January 1981 survey, was designed specifically to answer questions pertaining to both current and emerging residential trends and issues. The information gathered covers a broad range of topics, providing not only an up-to-date profile of the residential energy market served by NSP, but also a series of benchmarks to be used by NSP and others in planning, implementing and evaluating future activities involving residential customers.

The study covers eight areas related to residential energy use on the NSP system: (1) appliance saturations on the NSP system as well as in each service area within the system; (2) changes in appliance saturations over the years; (3) housing and household characteristics of the residential customers on the NSP system; (4) the effect of customer demographics on appliance saturations; (5) possible areas where fuel substitution and load management could occur; (6) the amount of conservation activity that has occurred in the last two years and the housing and household characteristics that affect it; (7) customer energy use, both electricity and natural gas, and how it is related to appliance, housing and household characteristics; and (8) customer groups that are of special interest to NSP — the low-income, the elderly and the low-income elderly — and how they compare to the corresponding customers not in these groups and all customers combined for the following: housing and household characteristics, appliance ownership, conservation activity, energy use and the percentage of income spent on NSP-supplied energy.

5401

Northern States Power Company
1981 Wisconsin Home Energy Audit Study.
Minneapolis, Minn.: Northern States Power Company.

Objectives: To assist in measuring the usefulness and impact of Northern States Power Company (NSP)'s Home Energy Audit (HEA) program, as well as to compare the characteristics of customers who have had the audit with the characteristics of those who have not.

Method: The data are based on a survey questionnaire which was mailed to test and control samples of NSP electric and natural gas space heating customers in Wisconsin who live in nonfarm single-family dwellings of one to three units.

Variables: Major variables include various attitudinal, demographic and dwelling-related measures; recent conservation behaviours; intended conservation behaviour; and participation in the HEA program.

Findings/implications: Only minor differences were found between the respondents who received the HEA from NSP and those who did not. Since there does not seem to be a specific type of household that is more apt to request a HEA, it is suggested that the HEA should continue to be marketed to all types of households. Based on findings that the rising costs of energy and decreasing supplies of energy seem to be important motivators of conservation behaviour, advertising should emphasize the potential savings which can be realized from conservation measures.

Another major conclusion is that the HEA is not a prime motivator in terms of getting its recipients to take conservation actions. The majority of recipients surveyed indicated that they would have taken the actions to conserve energy whether or not they had received an audit. It was also found that a significant portion of the HEA recipients surveyed had not, and did not, intend to take any conservation measures as a result of receiving the HEA. Further, the HEA was the sole conservation motivator for only about 12% of the customers receiving it. Because of these findings, it is suggested that the HEA not be given unduly large credit for the amount of conservation that is being initiated. The main function the HEA seems to provide is education. It is being used by its recipients as a source of ideas, information and direction.

5402

Northern States Power Company
1980 1980 Conservation Rate Break Study.
Minneapolis, Minn.: Northern States Power Company.

Objective: To evaluate the impact of a graduated service charge on electricity consumed by residential customers in the state of Minnesota. (This represents the second study conducted for this purpose, and the results of both studies are compared.)

Method: Questionnaires were mailed to a random sample of Northern States Power Company (NSP) residential electric customers who received a conservation rate break (CRB) on their electric bills during the month of May 1980 (N = 809). A second sample was composed of residential electric customers who received a CRB on their January 1979 bill. The customer characteristics of these samples were compared to the characteristics of all customers in Minnesota.

Variables: Major variables included household size, number of people home during the day, age of head of household, household income and type of dwelling.

Findings/implications: The authors question whether the achievement of the rate break is due to a concerted effort by customers to conserve or the coincidental result of their lifestyle. Based on the May 1980 survey, it would appear that customers who receive the CRB have certain distinct characteristics: many of them are apartment dwellers; they have fewer people in the household; they have fewer people home during the day; they have lower incomes; and they usually have fewer electric appliances. It would seem that these people are not receiving the CRB because they are necessarily trying to conserve, but because of their lifestyle and the fact that May is a "swing month" with lower than normal consumption. These results are further supported when the characteristics of consumers who received the CRB in both January and May are compared with the characteristics of those who received the break in May but not January. The results of this study are consistent with the findings of a similar study conducted in August 1979 by NSP.

5403

Northern States Power Company
1980 Survey of Homes Built in the 1970s.
Minneapolis, Minn.: Northern States Power Company.

Objective: To determine whether recently built single-family dwellings differ on such attributes as appliance saturations, housing and household characteristics, conservation measures taken and energy usage.

Method: Questionnaires were mailed to a random sample of Northern States Power Company (NSP) residential customers living in single-family dwellings built in 1974 (N = 577) and 1978 (N = 631). The sample was drawn from the four states in the NSP system: Minnesota, North Dakota, South Dakota and Wisconsin.

Variables: Major variables included measures of appliance saturation, housing characteristics, demographics, conservation behaviour and energy usage.

Findings/implications: Homes built in 1978 had significantly lower saturations of the following appliances than did homes built in 1974: freezers, central air conditioners, window air conditioners and dehumidifiers. This could indicate that the growing awareness of energy usage has led many people to believe that they can do without "non-essential" appliances in order to conserve energy. It could also reflect, in part, the relative newness of 1978 homes, with the occupants intending to add these appliances in the future. Other appliances showed significantly higher saturations in homes built in 1978; for example, electric ranges, microwave ovens, dishwashers and electric heating systems.

Families in homes built in 1978 appeared to have fewer household members on average, and the head of the household was often younger. There was no significant difference in total household income between the two subsamples.

Significant percentages of recently built homes in the NSP system were observed to have had conservation measures taken. For dwellings built in 1978, more conservation measures were taken when the dwelling was built. These homes also tended to have more energy-efficient appliances. For dwellings built in 1974, on the other hand, higher percentages of conservation measures were taken after the dwelling was built.

Northern States Power Company (cont.)

Average electric consumption in 1974 homes was significantly higher than the average electric consumption in 1978 homes. On the other hand, there was no significant difference in natural gas consumption between the two subsamples. Several possible reasons are given to explain these findings.

5600

Olsen, Marvin E.
1982 Public Acceptance of Consumer Energy Conservation Strategies.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objectives: The policy of reducing consumer energy consumption can be implemented through several different strategies or broad courses of action. Six alternative strategies for promoting energy conservation are investigated in this study: financial incentives, community programs, efficiency standards, land-use changes, consumption limits and price increases.

Method: Data for this study are taken from a mail survey conducted in the state of Washington in the spring of 1981 (N = 979).

Variables: Sociodemographic characteristics, attitudes toward each conservation strategy, commitment to the goal of energy conservation.

Findings/implications: Public acceptance of these strategies varies widely, from 83% for financial incentives to 9% for price increases. The single best predictor of acceptance of these strategies is a preference for a soft rather than hard energy policy path. The second best predictor is perceived seriousness of the energy problem. Seven predictor variables are used to construct a general path model for a Combined Strategies Index, which explains 20% of the variance on that index. For the most part, people who favour a particular strategy also tend to support conservation program proposals which utilize that strategy. In general, Americans can be described as supporting a diverse set of strategies for encouraging consumer energy conservation.

5601

Olsen, Marvin E.
1981 Consumers' Attitudes Toward Energy Conservation.
Journal of Social Issues, 37, 2, 108-131.

Abstract: Many surveys indicate that about half of all Americans believe that the energy problem is real and serious, and that less than one-fourth are completely unconvinced of the problem's existence. Many Americans also support relatively strong conservation policies, especially if they feel personally responsible for helping solve the problem and hold a broad environmental ethic. The latter values, which are linked with ideas of "voluntary simplicity," appear to be replacing traditional American beliefs with respect to material consumption. General attitudes toward the energy problem are not associated with reported conservation actions, but people who anticipate experiencing direct personal consequences from the energy problem are likely to take action to save energy. This is congruent with the Fishbein Attitude Model. Anticipated personal consequences, especially pertaining to one's health and comfort, are also a critical factor in predicting actual reductions in household energy consumption. The two most commonly expressed reasons for conserving energy are to save money and to help solve the energy problem. The author concludes with a discussion of unanswered theoretical questions and policy implications suggested by this survey of research on energy conservation attitudes.

5603

Olsen, Marvin E.
1981 Energy Conservation Attitudes and Actions in the Pacific Northwest.
Prepared for the Independent Review of the Washington Public Power Supply System, Nuclear Projects 4 and 5.

Abstract: This paper examines recent survey data on conservation attitudes and actions in the Pacific Northwest. The people of the region believe that energy conservation is important, although most of them also want to increase energy production — especially through the development of renewable resources. Respondents support a variety of different strategies and programs for promoting conservation and indicate a willingness to practice conservation in their own lives. Many, in fact, have already taken conservation actions in their households.

The author estimates that if households are strongly committed to saving energy and take a number of energy-conserving actions, these efforts could potentially reduce total residential consumption in the Pacific Northwest by over one-third.

5604

Olsen, Marvin E., and Christopher Cluett
1982 Voluntary Energy Conservation Through Neighbourhood Programs: Design and Evaluation.
Energy Systems and Policy, 6, 1, 161-192.

Objective: To evaluate the effectiveness of the Seattle City Light (the municipal electric utility) program in promoting energy conservation. Studies indicate that general information and education programs tend to be ineffective in promoting social change, but that people do tend to be receptive to new ideas that reach them through personal contacts. The household energy conservation program was therefore designed around a set of neighbourhood-based activities.

Method: A field experiment using a quasi-experimental design was conducted during 1978-79. Respondents were self-selected as a result of participating in the program. Data were collected at three points in time by means of questionnaires and interviews.

Variables: Independent: physical features of the household, characteristics of the residents, energy price changes, exposure to other conservation programs, weather conditions, level of exposure to the program, socioeconomic factors.

Dependent: attitudes toward the energy problem and energy conservation; preexposure, postexposure, household conservation actions; total energy consumption.

Findings/implications: Persons exposed to this program did not alter their attitudes in terms of becoming more favourably disposed toward energy conservation, but they did take significantly more household conservation actions than persons not exposed to the program. Further, they reduced their household energy use approximately 8% below predicted consumption levels.

5606

Ontario Hydro
1982 Resurvey of an "All-Electric" Residential Subdivision -- Mississauga.
Report R & MR 81-8, Ontario Hydro.

Abstract: This report contains the basic load data obtained in the resurvey of the Forest Glenn Subdivision in 1979. Similar data from a previous resurvey during 1971-72 are included for comparison. The initial survey took place in 1966-67. The houses in the subdivision are all-electric, utilizing central electric furnaces for space heating. Monitoring of this subdivision is ongoing in an effort to understand the effects of conservation and rate changes over a period of time. Between 1966-67 and 1971-72 the average annual increase in consumption per customer was reported as being 0.33%, and the average annual increase in demand per customer was reported as being 1.9%. This report indicates an average annual decrease in energy consumption per customer of 0.9%, and an average annual decrease in demand of 0.09% between 1971-72 and 1979 for the total sample (N = 27, 1979; N = 33, 1966-67 and 1971-72). If one home which has changed to gas heat is removed, the decrease in energy consumption per customer would be 0.6%.

5607

Ontario Ministry of Transportation and Communications
1981 MTC Vanpool Demonstration.
Downsview, Ont.: The Policy Planning and Research Division, Ontario Ministry of Transportation and Communications.

Abstract: The vanpool demonstration was initiated as part of a ride-sharing program to conserve energy and reduce road congestion. Primary objectives were to set an example to other employees and to gain firsthand experience in vanpooling and its administration to aid in its promotion across the province. Three vans were leased in a pilot program and supplied to groups of MTC employees for their daily commute to work. The fares charged were to be sufficient to cover the cost of leasing, insuring and licensing the vans, plus all the other direct costs associated with their operation. This report describes all aspects of the development, operation and evaluation of the demonstration, including comprehensive revenue and cost data. The demonstration proved successful in meeting all of its original objectives despite initial ridership in the pools being lower than expected. After 12 months of operation, all three vans were operating at or near capacity. Some major conclusions are that:

(1) because of the long trip lengths involved, the vanpools were particularly effective in conserving both gasoline and road-space use;

(2) a major consideration for employees evaluating the benefits of vanpooling is the reduced need for parking space;

(3) the immediate out-of-pocket travel cost savings of the riders were substantial, but the biggest benefit accrues to those who have reduced, or expect to be able to reduce, the number of cars owned by their household;

(4) the significant increase in travel time and the loss of flexibility in working hours are deterrents for many potential participants; and

(5) this small demonstration is shown to provide a substantial rate of return when initiation costs are spread over a five-year horizon.

Pacovsky, Joseph C. 6016
1980 Direct Control of Residential Furnaces.
Columbus, Nebr.: Nebraska Public Power District.

Objective: To assess the effectiveness of direct control of electric furnaces in reducing winter peak demands.

Method: Radio-controlled switches were installed on the furnaces of 16 York, Nebraska, homes. Service was interrupted at various periods throughout the winter of 1979-80.

Variables: Independent: treatment.

Dependent: energy consumption, comfort.

Findings/implications: There was an indication of some demand reduction attributable to the control; however, the author recommends further research on the topic. Only 1 of the 16 participants indicated any inconvenience because of the direct control. Fifteen respondents indicated a willingness to accept a control device in their home on a permanent basis in return for some form of incentive.

6017

Pacovsky, Joseph C.
1979 Direct Control of Residential Water Heaters and Air Conditioners.
Columbus, Nebr.: Nebraska Public Power District.

Objective: To assess the effectiveness of direct control of electric water heaters and air conditioning loads in reducing peak demands.

Method: An area of York, Nebraska, was selected for the study, and residents were contacted personally to gain their cooperation. A total of 35 homes were included in the test. Radio controls were placed on 50 loads in these 35 homes. Fifteen of the homes had both central air conditioners and electric water heaters; 20 of the homes had only central air conditioners. Consequently, controllers were installed on 15 electric water heaters and 35 central air conditioners. The test began June 4, 1979, and continued through September 28, 1979. Forty-two homes of a similar type, without controls, were also monitored during the experimental period.

Variables: Independent: treatment.

Dependent: electricity consumption.

Findings/implications: The demand savings, per control device, were calculated to be 0.16 kW·h from 2:00 p.m. to 2:30 p.m., 0.43 kW·h from 4:00 p.m. to 4:30 p.m., 0.36 kW·h from 6:00 p.m. to 6:30 p.m., and 0.33 kW·h from 8:00 p.m. to 8:30 p.m. Demand savings were not found to be as large as those reported in tests by other utilities. Various environmental reasons are posited as explanation for this difference.

6018

Palmborg, Christer
1982 Energy Consumption in Single-Family Houses: Consumer Sociological Aspects.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To explain the total variation in energy consumption that exists in similar or identical single-family houses.

Method: Structured questionnaires were completed by respondents living in 76 similar, all-electric houses. An air infiltration study was also conducted using the entire sample.

Variables: Independent: energy-related behavioural factors, value orientations, demographics, socioeconomic factors.

Dependent: total electrical energy consumption.

Findings/implications: This study analyzes energy consumption in terms of socioeconomic and social habit variables. In a step-wise multiple regression analysis, 87% of the total variation in energy consumption is explained by these background variables.

6019

Panko, Raymond R., and Hugh Folk
1982 Solar Water Heating Systems: A Study of Nonusers. Prepared for the Department of Planning and Economic Development, State Energy Office, Honolulu, Hawaii.

Objective: To gain a better understanding of nonusers of solar water heating systems (SWHS) in order to design more effective and efficient programs to promote solar energy use.

Method: In 1981, a random sample of 618 nonusers of SWHS in Hawaii were interviewed. Interviews were confined to owner-occupied houses. The interviewer probed the characteristics of nonusers, inquired about their reasons for nonuse, and solicited their interest in SWHS under various realistic conditions.

Variables: Independent: residents of owner-occupied houses not using SWHS, cost-benefit information.

Dependent: knowledge of SWHS, level of readiness.

Findings/implications: There is pervasive misinformation and confusion over the specifics of solar energy, which could decrease its attractiveness as an energy alternative. Cost-benefit information increases consumer interest in purchasing solar equipment. In addition, while cost is the major factor in purchasing SWHS, other factors, such as equipment reliability, the trustworthiness of solar companies and the absolescence of solar technology, also exert an influence on the consumer. The authors conclude that a clear, well-targeted promotional campaign could have a major impact on solar penetration in Hawaii.

6021

Parasuraman, A., and Charles M. Futrell
1980 Executives' Views About Energy Conservation: Problems and Prospects.
Journal of Energy and Development, 6, 2, 225-231.

Objective: To ascertain and analyze the views of business executives on energy-related matters in an effort to provide direction and depth for energy policymakers and conservationists.

Method: A questionnaire was mailed to 1,600 business firms in the southwestern United States that were selected at random from Standard and Poor's Register of Corporations, Directors and Executives. Usable responses were obtained from 360 firms.

Variables: Level of management, size of firm, perceptions about the seriousness of the energy crisis and the benefits of energy conservation.

Findings/implications: The results indicate a high degree of awareness that the problem of energy shortages is serious and is likely to get worse in the future. Such awareness is present across different managerial levels and across firms of various sizes. Furthermore, there is widespread recognition that the business community can contribute significantly toward national energy conservation. There also appears to be a keen interest on the part of the business community in energy conservation methods.

Almost 70% of respondents felt that a monetary investment in energy conservation would be worthwhile to them. That 21% were unsure of the benefits and 9% felt such an investment would not be beneficial should also be of concern to policymakers.

Conservation appeals that can clearly demonstrate the practicality of conservation methods and their ultimate monetary returns are more likely to be successful than general appeals based on the imminence of an energy crisis and the need for conservation behaviour. Financial incentives to conserve existing resources and to encourage the exploration of new energy resources would also appear to be important aspects of a national energy policy.

6022

Penner, S.S.
1979 Challenges in the Implementation of Energy Conservation. Energy, 4, 911-918.

Abstract: The penetration of energy conservation devices during the last few years has led to progressive reductions in estimated total energy demands for the United States and other countries. Relatively rapid reductions have been implemented in areas dominated by social habits. Significant gains are noted in the transportation and space conditioning sectors.

Following innovative marketing, a number of passive (solar) retrofit procedures have been found to yield effective potentials for significant energy conservation gains in the residential sector. Examples are ceiling insulation to reduce energy requirements for space conditioning, fenestration devices for windows to reduce air conditioning loads during the summer and insulation retrofits on inadequately insulated water heaters.

Over the long term, the major challenge in the residential sector concerns the design, construction and marketing of energy-efficient homes. These will utilize far less energy, on the average, than is currently needed, without requiring major changes in lifestyle. Systems studies allowing for technological innovation (e.g,. solar water heating and solar-space conditioning for multiple-family aggregates, walls with thermal storage, use of improved materials and designs) and removal of obstacles (e.g., zoning restrictions, outdated building codes, difficulties in obtaining proper financing) present outstanding challenges to designers, municipal planners and politicians alike.

Innovation in industrial production is more clearly defined than in the residential sector and will be facilitated by educating consumers on the importance of life cycle costing in making intelligent choices in the capital goods market, and by marginal pricing of energy supplies. Optimized economic evaluations from the consumer's and manufacturer's points of view are currently widely introduced and should play important roles in defining the long-term acceptabilities of more energy-efficient appliances, vehicles and other products. In many cases (e.g., cogeneration, district heating), market penetration will be delayed because of existing excess capacity (as in the electric utility sector) or current

Penner, S.S. (cont.)

availability of alternative techniques that will remain less costly than new technologies when life cycle costing is properly done. Delays in the introduction of improved technologies will generally be minimized by allowing fuel-price escalation to recover marginal costs.

Inventions and innovations in technologies that are not motivated by energy conservation goals (e.g., introduction of new generations of motor vehicles, aircraft and entertainment facilities such as colour TVs, stereo systems and videotapes) have played a dominant role in improving what many people view as their standard of living. These inventions and innovations have been responsible for rapidly escalating energy-use rates. In developing future scenarios for energy conservation, it is important to allow room for important inventions not yet conceived or not yet available (e.g., personal electric vehicles) and for the corresponding radical changes in energy-use patterns that may accompany their introduction. Without this provision, even the most benign energy conservation scenario may not justifiably be viewed as maintaining or augmenting the quality of life.

The concluding remarks briefly address life cycle costing and the relations between per capita income and energy use in different countries.

6023

Pfaffenberger, W., M. Meyer-Renschhausen, and O. Hohmeyer
1982 Energy Conservation by Private Households in the Federal Republic of Germany: Efficacy and Distributional Effects of Energy Policy.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objectives: (1) To examine the pattern of household energy consumption in the Federal Republic of Germany during the period after the oil crisis; and (2) to determine the impact of government policies on household behaviour.

Method: Two different data bases were used. In order to disaggregate statistical information on household energy consumption, various statistical sources (household surveys, energy balance, national accounts) were combined with the help of a computer model. In 1980, a survey of 3,000 households was conducted in the northwest of Germany which focused on energy conservation behaviour.

Variables: Demographics, various measures of household energy consumption, dwelling and heating characteristics, conservation behaviour.

Findings/implications: The results indicate that:

(1) energy conservation as a consequence of the price increases of 1979-80 came about mainly through various types of investment;

(2) the amount of energy conservation achieved is still relatively small;

(3) energy conservation policy has relatively neglected the supply side; and

(4) the efficacy of demand-oriented policies is doubtful because distributional effects were not sufficiently observed.

6024

Phifer, Susan P., Alfred J. Neven, and David T. Hartgen
1980 Family Reactions to Energy Constraints.
Transportation Research Record, 765, 12-6.

Objective: To assess less obvious and often unintended effects of a particular policy directive, a no-drive-day energy contingency action, using an interactive game technique called Response to Energy Actvity Constraints on Travel (REACT).

Method: Survey data from 12 households in Albany, New York, concerning reactions to the 1979 gasoline shortage were collected. The sample was generated using a "friends of friends" method. REACT, which is used to determine household reactions to a variety of policies by jointly showing activity locations, time schedules, travel adjustments, role reallocation and family decision making, was applied to the data.

Variables: Attitudes toward four different policies designed to reduce gasoline consumption, demographic variables.

Findings/implications: Two-car households would cut discretionary travel up to and beyond a 20% shortfall but would circumvent a no-drive-day policy by shifting travel to the other available car. One-car households, however, carpooled and shifted trip timing and destinations to adjust to both policies. These findings underline the importance of thoroughly investigating the possible impact of a proposed policy before implementing it. Traditional survey techniques, even trip diaries, generally overlook secondary effects such as those found in this study.

6026

Pignataro, L.J., W.R. McShane, A.J. Wiener, A.J. Bloch, and W.H. Crowell
1981 Future Directions for Public Transportation: A Basis for Decision.
Transportation Research Record, 797, 5-11.

Abstract: The future direction of public transport must be viewed in the context of the major forces that will influence society. This article identifies four major forces to consider: population demographics and dispersion, energy costs and availability, overall economics and technological change. Within the context of personal and economic forces at work in society, the authors recommend that less emphasis be placed on competition between transit and automobile and much more on articulation, system efficiency and balanced transportation. It is recognized that personal, individual transportation will continue to play a major role, although the technology and fuel of such transportation may change.

6027

Pimbert, S.L., and D.S. Fishman
1981 Some Recent Research into Home Heating.
Journal of Consumer Studies and Home Economics, 5, 1-2.

Abstract: Drawing on research conducted on the thermal environment in offices and homes, this paper examines the thermal conditions required and set by people and the factors which motivate their choices, particularly in the domestic environment. As part of an investigation into the performance of heating systems and the effectiveness of energy-saving measures, temperatures were monitored in 40 centrally heated English homes. The addition of extra insulation had no effect on the way people operated their heating system or on the temperature level set in the main living rooms. However, bedrooms were warmer and the importance of individual room temperature controls was demonstrated. Differences between people's thermal requirements in domestic and office environments are considered.

6031

Pitts, Robert E., John F. Willenborg, and Daniel J. Sherrell
1981 Consumer Adaptation to Gasoline Price Increases.
Journal of Consumer Research, 8, December, 322-330.

Objective: To analyze how consumers have reacted to the increasing price of gasoline in an environment of perceived shortages.

Method: Primary data were collected from the University of South Carolina Consumer Panel from 1973 to 1979 based on the results of 12 questionnaires. There were 217 households that met all criteria for inclusion in the study. Stepwise discriminant analysis was used to classify respondents.

Variables: Independent: gasoline prices, demographics, personality variables, number of cylinders per household.

Dependent: miles driven, attitudes, number of cylinders per household.

Findings/implications: The view that the 1979 period of gasoline price increases would lead to adaptive consumer behaviour was supported. Total miles driven per household decreased significantly in the period from 1975 to 1979. Average number of cylinders also declined in the same period. From 1975 to 1978 only 11% of the sample both downsized and cut back on miles driven; this increased to 15% in 1978 to 1979. The authors conclude that consumers react in a somewhat predictable manner to gasoline price increases, using demographic and personality variables as explanatory factors. In general, it was found that gasoline prices did not discourage driving, except among specific segments whose financial condition could not accommodate higher prices. Consumers appear to want to "preserve their lifestyles" and will do so until the costs become prohibitive. The authors state that the inherent price inelasticity of gasoline makes reliance on the price mechanism to slow down consumption ill-advised. They suggest that policymakers should offer more alternative forms of adaptive behaviour to consumers because consumers seem willing to adapt.

Pitts, Robert E., and James L. Wittenbach 6036
1981 Tax Credits as a Means of Influencing Consumer Behavior. Journal of Consumer Research, 8, December, 335-338.

Objectives: (1) To examine the merits of tax credits as a means of stimulating behaviour; and (2) to report the results of a study measuring the impact of the energy tax credit on the decision of consumers to insulate their homes.

Method: A study of the Residential Energy Conservation Tax Credit was conducted in the spring of 1979 in a middle-sized midwestern U.S. city. Two hundred purchasers of residential energy-conserving products were contacted, and 146 of these agreed to provide all the information requested. Respondents were asked a series of questions concerning the importance of the energy tax credit in their decision to purchase insulation, their knowledge of the credit and where they got this information.

Variables: Independent: demographics, socioeconomic variables, time of purchase of insulation.

Dependent: awareness of credit, importance of credit to purchase decision.

Findings/implications: Even those respondents who claimed the tax credit on their income tax did not fully understand it. Forty-two per cent of the respondents reported that the credit was important in their decision to purchase insulation. Energy costs were ranked as the most important factor in the purchase decision by 95% of the respondents. Fifty-three per cent knew of the credit before the purchase, with an additional 8% indicating that they heard of it at the time of purchase. The authors conclude that the Residential Energy Tax Credit had a minimal effect on major insulation purchase decisions. Not one of the respondents considered the credit to be sufficiently important that the purchase would not have been made without it. The lack of impact was, in part, due to limited consumer knowledge. The amount of consumer purchase was found to be a factor of need and ability to make the necessary purchase as opposed to knowledge of the credit. The study also supports the contention that tax credits do not benefit low-income families as much as they benefit high-income families.

6050

Preda, Gheorghe, Henry N. McCarl, Khalid Bourquia, Stana Brinzei, and Viozel Preda

1982 Public Transportation: Energy Conservation and Socio-Economic Issues in the Expansion of This Transportation Mode. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper examines the way in which urban and interurban public passenger transportation may contribute to a reduction in energy consumption. The field of passenger transportation is one in which a trend toward energy-intensive transportation has developed.

Measures for conserving energy in the public transport sector (motor buses, trolley buses, tramways and underground railways) are presented and then classified under three headings: transport development and modernization, improvement of energy parameters, technical-organizational.

This paper also demonstrates that by knowing the advantages and disadvantages of the various means of public transportation, one can make useful comparisons among them or with other forms of passenger transportation such as planes and automobiles.

Finally, energy conservation through the expansion of public transportation is discussed in light of energy-related and socioeconomic factors.

Puget Sound Power & Light Company 6060
1981 Residential Wood Heating Survey.
Puget Sound, Wash.: Puget Sound Power & Light Company.

Objectives: (1) To determine how many households have wood heating systems and how they are used; and (2) to survey other conservation actions and alternative energy interests.

Method: A telephone survey of 338 single-family residential households was undertaken in August and September 1980.

Variables: Independent: socioeconomic variables; attitudes toward wood heat, conservation; energy preferences.

Dependent: type of home-heating system.

Findings/implications: The growth in the use of wood-heating systems is expected to continue for the next several years. The principal factors influencing the use of wood-heating systems are the cost of other space heating fuels, the comfort of wood heat, and the quality of the construction of the wood stove or the fireplace insert. The least important factors influencing the use of wood are the inconvenience of bringing it in, its cost and wood-heating system maintenance. Respondents indicated the following alternative energy preferences: wood (39.29%), solar (32.3%) and wind power (10.8%).

6826

Reister, David B.
1982 Energy Conservation -- The Post-Embargo Record.
Energy, 7, 5, 403-411.

Abstract: The position of this paper is that the best measure of energy conservation is a change in the ratio of energy demand and GNP. In the last decade, the ratio has decreased by 16%. A simple model has been developed to forecast energy demand as a function of real energy price. The model can successfully backcast the post-embargo period. The long-run price elasticity of the model is unexpectedly large. The model forecasts that the ratio of energy demand and GNP will decline by an additional 34% at current energy prices.

Renaud, I.P.W. 6829

1982 The Position of the Energy Consumer in the Netherlands' National Programme on Energy Research.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper discusses the Netherlands' national program on energy research in terms of its objectives, composition and audience. Particular emphasis is placed on those aspects of the program dealing with energy consumption (i.e., the development of products and techniques, their application and the development of policy). The author stresses the need to incorporate input from the social sciences into energy-related research as well as the need for more input from consumers.

6836

Rew, A.W., and F.R. Delauzun

1982 Consumer and Social Interests in U.K. Energy Conservation at the Local Level: The Case of Combined Heat and Power/District Heating (CHP/DH).
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper is based on the results of two field studies and other relevant desk research conducted in the Department of Energy (U.K.) on the social acceptability of CHP/DH. Individual and community responses and levels of satisfaction with CHP/DH are analyzed in light of consumer interests in energy conservation. Policy issues and implications of the development of a CHP/DH scheme for local authorities are also explored. Particular reference is made to the relevance of energy conservation aspects in the marketing of CHP/DH and to the appropriate pattern for communicating such information to the public.

6849

Ritchie, J.R. Brent, Gordon H.G. McDougall, and John D. Claxton
1981 Complexities of Household Energy Consumption and Conservation.
Journal of Consumer Research, 8, December, 233-242.

Objectives: (1) To assess the extent to which in-home energy and gasoline consumption can be explained by each of four classes of variables; and (2) to assess the extent to which a combination of these four variables can explain in-home energy and gasoline consumption.

Method: A national sample (N = 2,366) of Canadian households, using a panel, was surveyed by mail in January 1979. Gasoline consumption data were obtained in the form of respondent estimates of miles per gallon for city and highway travel, proportions of city and highway driving, and annual miles driven. Energy suppliers were the source of the heating fuel and electricity consumption data. The national meteorological service was the source of climatic data.

Variables: Independent: climatic variables; dwelling/appliance/vehicle descriptors; family demographic characteristics; attitudes of male and female household heads.

Dependent: in-home energy and gasoline consumption.

Findings/implications: Both colder winter temperatures and increased household size were related to in-home energy consumption. Unexpectedly, there was a lack of relation between regional differences and house shape with in-home energy consumption. The only family influence variable that had the expected effect was family size. The number of vehicles and mean vehicle weight were both found to be positively associated with gasoline consumption, whereas climatic and regional variables were insignificant determinants of gasoline consumption. Gasoline consumption was found to increase with larger numbers of driving-age family members and to be lower for older people. The authors conclude that income as the key to energy consumption is much too simplistic a conclusion. The analysis provided in this paper identified a number of characteristics of heavy users of energy. The study also lends support to previous studies that indicate that conservation efforts which focus on changing attitudes are likely to have a low payoff in terms of actual energy savings. The authors also conclude that since a major portion of household energy consumption is circumscribed by the programs aimed at improving the energy efficiency of the housing stock, they should receive priority.

6854

Roessner, J. David
1982 Commercializing Solar Technology: The Government Role. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: The U.S. government's experience with programs to accelerate the pace with which new energy technologies are developed and introduced into private markets offers an opportunity to assess alternative technology commercialization strategies. Analysis of industry and government activities over the 1974-80 period for three solar technologies was conducted within a framework based on models of the evolution of innovation-based industries and on the concept of technology delivery systems. Government commercialization strategies varied in the degree to which they matched the evolutionary status of each solar technology and its associated industry and delivery system. Generally, the greater the mismatch, the larger the negative consequences for the pace of commercialization and, indirectly, for the taxpayer.

Rohles, Frederick H. Jr. 6861
1981 Thermal Comfort and Strategies for Energy Conservation. Journal of Social Issues, 37, 2, 132-149.

__Abstract__: The author discusses how the various components of thermal comfort may be modified in the interests of conserving energy. He notes that thermal comfort is dependent upon seven component variables: air temperature, relative humidity, mean radiant temperature, air velocity, clothing, physical activity and time. These seven variables are then discussed in terms of ways in which they may be modified, such as the Federal Emergency Building Temperature Restriction Plan, night set-back of thermostats, accidental hypothermia in the elderly, seasonal effects, and the effects of interior decor on perceptions of thermal comfort. The author also indicates that studies in these areas must include the issue of personal preference.

6862

Romanos, Michael C., Michael Hatmaker, and Poulicos Prastacos
1981 Transportation Energy Conservation and Urban Growth. Transportation Research, 15, A, 215-222.

Abstract: This paper investigates the role of transportation energy consumption constraints in the organization of an urban system, and the relative allocation of its land-use activities through the use of a combined land-use transportation model based on a modification of TOPAZ. In addition to the formulation of the mathematical structure of the model, the paper reports on the development of the solution algorithm and some preliminary tests indicating rapid model convergence and minimal computational costs. These tests also reveal that transportation energy cost is an important variable in determining metropolitan structure and the location of urban activities.

6863

Rosa, Eugene A., Marvin E. Olsen, and Don A. Dillman
1982 Nuclear Energy and the Public Under the Reagan Administration: Prospects for Ending the Stalemate.
Presented at the symposium on Nuclear Power and the Public: Are There Critical Masses? Annual Meetings of the American Association for the Advancement of Science, Washington, D.C., January 4, 1982.

Abstract: This paper examines the public climate surrounding nuclear energy. Trends in national polls were examined to obtain a rough profile of American views on nuclear power. While the Three Mile Island accident appears to have created a great deal of ambivalence and unease, policy preferences among the public do not mirror the polarized positions of experts and decision makers. While a sizeable proportion of the public appears to be polarized on the issue of nuclear energy versus conservation, a smaller but still sizeable proportion favours both (15%-22%) or neither (19%-27%). One interesting finding is that regardless of policy preference, many people have already adopted or are adopting a range of conservation practices. The policy implications of these findings are briefly discussed.

6864

Rosson, Philip J., and Robert W. Sweitzer
1981 Home Heating Oil Consumption: Profiling "Efficient" and "Inefficient" Households.
Energy Policy, 9, 3, 216-225.

Objectives: (1) To determine the relative importance of temperature, heat losses and furnace efficiency in explaining heating oil consumption; and (2) to determine what types of households are relatively "efficient" and "inefficient" in their use of heating oil, given their conservation behaviour.

Method: A probability sample of 360 urban households was drawn from two eastern Canadian cities. Two sources of data were used. Interviews were conducted to get information on the individual households. Actual fuel oil usage data were collected from supplying companies.

Variables: Independent: demographic and lifestyle variables; housing characteristics; responses to AIO (attitudes, interests and opinions) statements; temperature; heat losses; and furnace efficiency.

Dependent: heating oil consumption.

Findings/implications: The findings suggest that the profile of each household type is very consistent across the six conservation actions considered. Demographically, "inefficient" households are older families that have less schooling, are less healthy, smaller in size and lower in income. In lifestyle terms, the most common attributes of these households are that they have a lower level of home conservation knowledge, are less active in and around the home, and budget and plan less than others. Having profiled the "inefficient" household, certain conservation program themes are suggested which could be targeted at this category of consumers. Of the three physical housing factors studied, heat loss is the largest single determinant of heating oil consumption.

Rudelius, William, Gary Dodge, and Richard Weijo 6874
1982 Marketing Energy Conservation to Homeowners: An Action Program from Public Policy Research.
Working paper no. 65-1. Division of Research of the School of Management of the University of Minnesota.

Abstract: The authors indicate that public appeals for energy conservation based on patriotism do not work; it is a classic example of the tragedy of the commons. The authors endeavour to provide a simple, integrative framework to describe the decisions homeowners make in terms of saving energy. They relate programs of governments and energy utilities, as well as existing research studies, to this framework. Finally, they use energy-saving actions and plans of a large sample of households to estimate potential communitywide energy savings. The authors state that homeowners go through four stages in making a conscious energy-saving decision: awareness, choice, implementation and use/evaluation. Based on published reports, survey data on energy conservation activities by homeowners, and estimates of dollar costs and savings of these activities provided by government agencies and energy utilities, the authors conclude that homeowners must be provided with more precise information showing specific dollar costs and savings for various energy actions. They also note that numerous environmental variables make publicly provided information the most viable option for policymakers, but that this information must be made more accessible and relevant.

7206

Sachs, Wolfgang
1982 Are Energy-Intensive Life-Images Fading? The Cultural Meaning of the Automobile in Transition.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: The paper focuses on the symbolic significance of energy-consuming technology. It analyzes the case of the automobile and demonstrates that it cannot be considered simply as a technical device for transporting people; it is also a cultural symbol infused with desires, meanings and life-images. The origins, the content and the dynamics of the meaning of the automobile are explored in order to identify the cultural transformations that are implied in a transition to a low-energy society and, possibly, to a low-speed society.

The first section of the paper sets out the patterns of life-conceptions centred around the automobile, and the second section examines actual counterforces that undermine this car-oriented lifestyle and lead to disenchantment with the automobile. It is concluded that while the images of a desirable society are becoming less and less associated with cars, the car appears to remain to be an inevitable necessity.

7211

Sahi, R.K., and R.W. Erdmann
1981 Energy Prices and Conservation: The Canadian Experience. Energy Policy, 9, 3, 197-204.

Abstract: Using an econometric energy demand model, this paper separates price from nonprice conservation effects in the period 1974-77. It examines what might have happened to Canadian energy demands if Canada had priced its energy at OPEC equivalent levels instead of pursuing a gradual phase-in policy. Prices accounted for the major proportion of energy savings over the period 1974-77, particularly in the industrial and transport sectors, and for oil and gas. Nonprice effects seem to have had a larger impact in the earlier years and for oil and electricity. Movement to international prices during the period studied could have reduced Canadian secondary energy demands by the oil equivalent output of 1.3 Syncrude-sized (125,000 barrels/day) oilsands plants.

7212

Samprone, Joseph C., and Roy Savoian
1980 Gasoline Conservation and Motor Fuel Taxation Policy: The Dilemma for State Government Financing.
Journal of Energy and Development, 6, 2, 251-262.

Abstract: This article examines, on a state-by-state basis from 1980 to 1985, the revenue effects which would result from the interaction between gasoline conservation and the current motor fuel taxation policy of the individual states. It demonstrates that gasoline conservation, achieved through federal fuel-efficiency standards for new automobiles, will engender tax revenue reductions for individual states. Based on the differential revenue effects derived from several alternative motor fuel tax strategies to mitigate or eliminate the potential revenue reduction, some form of ad valorem tax represents a suitable replacement for the per gallon motor fuel tax that currently exists in all states.

7213

Sander, Diana E.
1976 The Price of Energy.
Annual Review of Energy, 1, 391-421.

Abstract: The author indicates that recent events have brought about a renewed interest in energy demand and rate structures. She contends that the era of cheap energy, at least in terms of the next ten years, seems to have come to an end. While it is true that energy prices in the next few years will be heavily influenced by international political policy, it seems apparent that energy prices will stay high. The main purpose of this article was to provide an overview of how price has evolved as a tool to signal the consumer which volumes and sources of energy will yield the greatest satisfaction from society's limited resources. The factors which influence the price of energy include the physical scarcity of the energy source, OPEC, the extent of distortions in the level of demand for energy sources due to historically low prices, the importance to society of a "clean" environment, and government policy. Following a discussion of the historical development of energy prices, the author moves on to analyze certain critical pricing issues such as deregulation, incremental pricing of electricity and adjustment clauses.

7214

San Diego Gas and Electric
1981 Home Energy Audit Pilot Program Research-Wave II.
San Diego, Calif.: San Diego Gas and Electric.

Objective: To measure the effectiveness of the Home Energy Audit Pilot Program.

Method: Telephone interviews were conducted with 362 householders who participated in the audit during the period October 1, 1979, through March 1, 1980. All respondents were adults (over 18) and observed the analysis as it was being carried out. Interviewing took place during the latter part of August 1980.

Variables: Various attitude and behavioural measures.

Findings/implications: (1) General reaction to the recommendations made during the audit was extremely positive. At least 95% of the respondents found the recommendations easy to understand, logical sounding and detailed enough.

(2) Over one-half (56%) of the audit participants interviewed had already installed, or had someone install, at least one of the recommended items.

(3) A median of 3.4 items were recommended per household, with 1.2 items actually installed.

(4) Water heater blankets were recommended to the greatest number of households, along with lighting conversion and weather stripping.

(5) A series of 11 conservation practices were included on the analysis form for recommendation to the appropriate participants. An average of 5.9 practices were recommended for each household. The median number of practices being conducted after the audit was 4.1.

(6) Utilizing low-flow shower heads and shower-flow restrictors were practices recommended to the majority of the households (98% and 80%), with "turning off furnace pilot in summer" close behind (88%).

(7) The hope of saving money on utility bills was the most important reason for participating in the audit.

(8) Basic awareness of an energy shortage has increased since the Wave I study.

San Diego Gas and Electric (cont.)

(9) The audit was well received by participants; it reached or surpassed their expectations in 90% of cases.

(10) Positive comments about the audit were made by 90% of the respondents. When asked what they disliked, 71% had no response.

(11) The auditor made a favourable impression on the majority of respondents. More than 90% of respondents reported that their auditor was careful around the house, and able to discuss results clearly, answer questions effectively and explain findings satisfactorily.

(12) More than half the respondents (55%) reported having an unfavourable attitude toward San Diego Gas and Electric. This is almost four times as many as in Wave I, which was conducted in October 1979. This may be at least partially due to the fact that a large number of audit participants in Wave II had high-bill complaints and were referred to the audit by customer service, whereas in Wave I the participants heard about the audit through direct mail. This can be further illustrated in the higher average monthly bill amounts of the audit participants ($62) as compared to the Bardsley-Haslacher Corporate Image Study ($52).

7219

Sargious, Michel A., and David Szplett
1979 Some Measures of Energy Conservation in Urban Transportation in Canada.
Journal of Energy and Development, 5, 1, 44-56.

Abstract: This paper examines two separate strategies for reducing energy consumption in urban passenger transportation. The first is through improvements in the size mix and average fleet fuel economy of the automobile; the second is through planning the growth of urban areas in such a way as to minimize the travel requirements of local residents. The city of Calgary, Alberta, is used as a case study area for this analysis. The paper concludes that a careful analysis of the present pattern of automotive fuel consumption can be utilized to develop procedures that could reduce the urban automobile fuel budget of Canada by about 38% in 1985. The two procedures are attractive conservation strategies because they can be implemented without significantly changing the travel behaviour of the population.

7221

Scherhorn, E., and H.W. Logman
1979 Energy Use and Energy Saving in Households.
Vakbloid voor Huishondkunde, 1, 2, 33-42.

Objective: To identify variables determining the energy use in private households.

Method: Structured, in-home interviews were conducted with a sample of 27 households. This sample deviates from the general population in the sense that it is characterized by a higher level of income, education and occupation. More sample households are in the 25 to 30-year age bracket. The respondents were from seven neighbourhoods in Wageningen, The Netherlands.

Variables: Independent: "direct variables": size of the house, number of rooms, type of heating system, desired home temperature, type of hot water system; "indirect variables": income, education of husband, family size, number and type of appliances, stage in family life-cycle, absence/presence of housewife during the day. Some attitude and behaviour variables.

Dependent: household use of natural gas, coal and oil.

Findings/implications: Direct variables have higher correlations (Kendall's tau) with energy use than indirect variables although: (1) heavy energy users tend to heat all rooms; (2) light energy users heat only some rooms; and (3) desired temperature has no significant effect.

Additional analysis of attitudes and knowledge concerning energy saving reveals that attitude and knowledge are not related to energy use.

The limitations of this study are the sample characteristics, the different types of homes (not adequately taken care of in the design), the low level of analysis (no regressions, only Kendall's tau) and the lack of a model for the data analysis. Conclusions based on this study should be considered with reservations.

7226

Schipper, Lee
1976 Raising the Productivity of Energy Utilization.
Annual Review of Energy, 1, 455-517.

Abstract: Until recently, conservation was virtually ignored in the energy sector in favour of discovering new sources of energy. The author provides a review of some of the implications of more productive energy utilization. Economic analysis of the physical options for conservation shows that saving 30%-40% of the expected future total energy demand in the United States would be far less expensive than supplying the increased amounts of fuels and electricity indicated by extrapolation of historical trends. The author demonstrates that conservation strategies tend to increase employment and decrease pollution while saving energy and money. It is pointed out that there are several barriers to energy conservation, including a society based on cheap energy and poor control of the end-use of energy. Several policy alternatives are suggested as possible means of encouraging a more efficient utilization of energy: decontrol of fuel prices, energy taxes, rationing or allocation, subsidies, bans, educational programs and/or mixes of the above. The author concludes that inefficient energy use must lead to an inefficient economy.

7227

Schipper, Lee, and Andrea Ketoff
1982 Home Energy Use in Nine Countries: How Much Have We Saved? Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: In 1979, the Lawrence Berkeley Laboratory was asked by the U.S. Energy Information Administration of the Department of Energy to gather demographic, economic and energy data for the residentia sectors of a variety of OECD countries. Since neither the OECD nor most of its member countries kept such statistics for the residential sector in one place, this study focused on data collection during the first two years.

The countries covered include Canada, Denmark, France, the Federal Republic of Germany, Italy, Japan, Sweden, the United Kingdom and the United States. The data collected included information about incomes and expenditure, size of households and dwelling characteristics, household equipment, and actual consumption of fuels, often by purpose and dwelling type. The output of the study includes a data base covering energy use from 1960 to 1980 and several analyses of comparative consumption patterns and their evolution. Econometric analysis of the energy consumption data is underway. This paper highlights the data findings and analytical results, and discusses the changes in energy use that have taken place over the past decade. Implications for developing countries are also discussed.

7236

Schipper, Lee, and Allan J. Lichtenberg
1976 Efficient Energy Use and Well-Being: The Swedish Example.
Science, 194, December, 1001-1013.

Abstract: This paper compares energy use in the United States with that in Sweden, a country which in 1971 used 60% as much energy as the United States to generate each dollar of GNP, despite a relatively equivalent GNP per capita. The years 1970-72 were taken as the basis for comparison because complete data were available. Energy-use comparisons are the key part of the article, but these were complemented with both physical and economic comparisons in order to make the energy-consumption figures more relevant. In general, Sweden pays more for energy than does the United States. This difference, however, was not found to be the only explanatory variable accounting for the more efficient use of energy in Sweden. Institutional and social factors also play a major role. For example: building codes are more stringent in Sweden; the Swedish government has given priority to energy conservation in housing loans; and Swedish passenger transport has been greatly impacted by government policy. The authors conclude — with some hesitancy about quoting an exact figure — that if the United States were to adopt Swedish methods of energy conservation, including smaller cars, better structures and more efficient use of process heat, it could reduce total energy use by 30%.

7237

Sears, David O., Tom R. Tyler, Jack Citrin, and Donald R. Kinder
1978 Political System Support and Public Response to the Energy Crisis.
American Journal of Political Science, 22, 1, 56-82.

Objective: To study the determinants of public compliance with the government's official policy during the energy crisis of 1974.

Method: The authors utilized the twice-yearly omnibus survey of Los Angeles county (late February and early March of 1974) conducted by the UCLA Survey Research Centre. The 1,069 respondents in the survey constituted a multistage probability sample of county residents 18 years of age and older.

Variables: Independent: demographics; two measures of diffuse support, the Diffuse Support Index and the Political Alienation Index; partisanship measures.

Dependent: agreement/disagreement with the government's position on the energy crisis, self-reported changes in behaviour.

Findings/implications: No evidence was found of any differences between allegiant and disaffected citizens with respect to energy-consumption patterns. The authors thus conclude that more widespread pride and trust in prevailing political institutions and authorities would have had little impact on the motivation of citizens to comply with the government's request for a reduction in energy consumption. Moreover, no evidence was found that would identify any special conditions under which the diffuse support did influence behavioural change. Behavioural compliance with the government's request was instead influenced by situational constraints. The implication of this is that widespread public cynicism about the political process does not necessarily mean that the effectiveness of public policy will be undermined. The authors conclude that the failure of diffuse support and partisan attitudes to affect patterns of gasoline and electricity use confirms much of the previous research on the gap between global attitudes and specific behaviour.

7238

Seattle City Light

1981 Evaluation of Seattle City Light's Residential Insulation Program.
Seattle, Wash.: Conservation and Solar Division, City Light Department.

Abstract: This report presents the findings of an extensive study of City Light's pilot home insulation financing program, which began in 1978. The evaluation of the Residential Insulation Program was designed to serve three purposes: (1) to analyze the program operations in order to identify areas for improvement in service delivery; (2) to determine whether or not the program saved electrical energy; and (3) to measure the cost-effectiveness of the program. Evaluation findings address the extent of program participation, experience with weatherization contractors, electrical energy savings and cost-effectiveness. Recommendations are made to improve program delivery and impact.

7239

Seligman, Clive, John M. Darley, and Lawrence J. Becker
1977 Behavioral Approaches to Residential Energy Conservation. Energy and Buildings, 1, 325-337.

Abstract: This article describes several studies with a social science orientation towards energy conservation. The results of two attitudinal surveys conducted in Twin Rivers, New Jersey, indicate that summer electricity consumption could be predicted from respondents' energy-related attitudes. It was found that personal comfort and health concerns are the best predictors of consumption. In addition to the two attitudinal studies, this article reports on three feedback studies. It was found that daily consumption feedback reduced electricity consumption by 10.5%. Daily consumption feedback in conjunction with a difficult conservation goal led to electricity consumption being reduced by 13%. The third study, in which homeowners were signalled by a device telling them when it would be more efficient to cool their house by opening windows than with the air conditioner, resulted in savings of 15.7%. The main conclusion drawn from this analysis of five studies is that behavioural factors play an important role in energy consumption and conservation.

7241

Seligman, Clive, and R. Bruce Hutton
1981 Evaluating Energy Conservation Programs.
Journal of Social Issues, 37, 2, 51-72.

Abstract: This article examines the problems involved in conducting program evaluation in the field of energy conservation. First, the authors offer a view of evaluation research that highlights its similarities to basic research. Criticisms of this view are presented, and it is suggested that an understanding of the issue of formative and summative evaluations may resolve some of the points of difference. Then, various stages of evaluation research are examined within the context of energy conservation programs, and it is argued that experimental evaluations are desirable and feasible.

7242

Shama, Avraham, and Kenneth Jacobs
1981 Accelerating the Adoption of Conservation Energy.
Journal of Environmental Systems, 10, 4, 1980-81, 353-364.

Abstract: This paper argues that the absence of a marketing-oriented behavioural perspective from energy analyses dominated by an economic-engineering perspective is a major reason for the low adoption rate of conservation energy. Unless these two perspectives are integrated, little can be expected in the way of speedy market penetration of conservation energy. Using the diffusion of innovation framework, the authors make several recommendations in the following areas: developing conservation energy systems; targeting conservation energy systems; informing and motivating the consumer; marginal social-cost pricing; offering financial services; ensuring appropriate distribution; discouraging energy-inefficient practices; and using flexible mandates.

7271

Sinden, Frank W.
1977 A Two-Thirds Reduction in the Space Heat Requirement of a Twin Rivers Townhouse.
Energy and Buildings, 1, 1977-78, 243-260.

Objective: To determine how far space heat conservation could economically be taken by carrying out extensive retrofitting of townhouses.

Method: A Twin Rivers, New Jersey, townhouse received a series of retrofits which were more extensive than those used in previous experiments at Twin Rivers. Annual energy use was measured before and after the retrofits.

Variables: Independent: interior window insulators, basement and attic insulation, systematic elimination of air infiltration.

Dependent: energy consumption, heat loss.

Findings/implications: The retrofits resulted in a 67% reduction in energy use for space heating. Thermal heat loss was reduced by 50%. The author concludes that the results support a growing body of evidence that large amounts of space heat can be economically saved by means of many small, low-technology measures. In addition, he believes that some higher-technology measures may be able to save more. Overall, the measures employed in this study appear to be economical at a return of 10% tax-free on investment.

Slavin, Robert E., John S. Wodarski, and Bernard L. Blackburn 7272
1981 A Group Contingency for Electricity Conservation in Master-Metered Apartments.
Journal of Applied Behavior Analysis, 14, 3, 357-363.

Objective: To examine the effects of a group contingency on electricity conservation.

Method: Two studies were conducted. In the first study, residents of 166 apartment units received biweekly payments of the value of electricity saved compared to predicted use. In the second study, residents of 255 apartment units received a payment of only 50% of savings.

Variables: Independent: household appliances, payments.

Dependent: electricity consumption.

Findings/implications: A group contingency package for saving energy in master-metered apartments appears to be moderately effective. The subjects of study one saved an average of 6.2%; those of study two, an average of 6.9%. The authors postulate that interpersonal social variables may be as important as financial considerations in reinforcing energy conservation behaviour. The savings found in this study are considered to be only a small portion of the realizable potential savings in master-metered apartment buildings, according to the authors.

7273

Snohomish County Public Utility District No. 1
1982 Study of the Effects of Price Elasticity on Residential Consumption.
Everett, Wash.: Snohomish County Public Utility District No. 1.

Abstract: This study attempts to estimate empirically the price elasticity of demand for the residential customer class in Snohomish County. The District's monthly light and power data supplied consumption and customer data. The price of electricity was taken from the District's Conservation Department. Hourly earnings of employees in the state of Washington were used as a proxy for household income in the county. Prices and income were converted into real (constant) terms to eliminate the effects of inflation. In the analysis, ordinary least squares and generalized least squares were used. The two methods produce extreme values for the short-run price elasticity for electricity which range from -0.063 to -0.175. This means that a doubling of the price after inflation, other things remaining constant, would theoretically yield a decline in average consumption per customer of 6.3% to 17.5% within about a year. The long-run range of values is -0.122 to -0.309 with a decline of 12.2% to 30.9% after about five years. Any drop in consumption can be offset or compounded by changes in other variables. Some probable scenarios are discussed in the article.

Sonderegger, Robert C. 7281

1977 Movers and Stayers: The Resident's Contribution to Variation Across Houses in Energy Consumption for Space Heating. Energy and Buildings, 1, 1977-78, 313-324.

Objective: To distinguish the relative contributions of the resident and of the housing structure to energy consumption.

Method: Changes in energy consumption were measured for a sample of houses which changed hands. Another sample of houses without change in ownership, "the stayers," was also monitored. The samples included 205 townhouses in Twin Rivers, New Jersey. Natural gas consumption, with respect to space heating only, was monitored over a six-month winter period from November 1971 to April 1972.

Variables: Independent: "stayer/mover," housing characteristics.

Dependent: natural gas consumption.

Findings/implications: About 54% of the variation in natural gas consumption was explained by physical housing characteristics. The remaining 46% of the variation is explained by three different factors. The first two refer to occupant-related consumption patterns: (1) nonpersistent consumption patterns of occupant and/or house, and (2) persistent behaviour patterns of the occupants. The third factor relates to house quality differences: (3) persistent consumption patterns of the house. The authors state that 71% of the variation unexplained by conventional factors is caused by occupant-related consumption patterns (a combination of factors 1 and 2 above) and 29% by persistent house-related quality differences (factor 3 above). The results show that unpredictable behaviour patterns of the occupants introduce a large source of uncertainty in the computation of residential space heating energy requirements. Among the implications drawn from this is that there is little use in pushing too far the detail of any deterministic model for the prediction of heating load requirements. A corollary to that is the implication that the effects of retrofits should be tested on many houses occupied by real people. Studies that address energy conservation without examining the residents are found to be incomplete.

7291

Statistics Canada
1981 (A) Passenger Car Fuel Consumption Survey, January-March, 1980.
(B) Passenger Car Fuel Consumption Survey, April-June, 1980. Ottawa: Statistics Canada.

Objective: To establish a data base concerning personal use of the passenger car in Canada which would contain the following information: total distance travelled, total amount of fuel consumed, average distance obtained per unit of fuel, total expenditures on fuel, and seasonal fluctuations in fuel consumption and in distance travelled.

Method: A monthly survey has been developed and was first implemented in July 1979. A telephone interview is conducted to trace selected vehicles to the registered owners. A fuel purchase diary is then mailed to the principal driver of the car. The results are tabulated on a quarterly basis.

Variables: Independent: vehicle type and use.

Dependent: fuel purchases, fuel prices, type of fuel, odometer readings, purchase amount, total paid per survey month.

Findings/implications: (A) During the first three months of 1980, it is estimated that there were 6.9 million personal-use passenger cars operated in Canada, excluding 1979 models in Quebec. These cars were driven 23 Gkm and consumed 4 GL of fuel. Their average fuel consumption was 18.2 L/(100 km). The average daily distance per vehicle was 37 km, and the average daily fuel consumption was 7.0 L.

(B) During the second quarter of 1980, it is estimated that there were 7 million personal-use passenger cars operated in Canada, excluding 1979 models in Quebec. These cars were driven 29 Gkm and consumed 4 GL of fuel. Their average fuel consumption was 15.2 L/(100 km). The average daily distance per vehicle was 45 km, and the average daily fuel consumption was 7.0 L.

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*The symbol G indicates one thousand times one million (10^9).

Stern, Paul C., J. Stanley Black, and Julie T. Elworth 7293
1982 Personal and Contextual Influences on Household Energy Adaptations.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objectives: To examine the interactive effects of economic, demographic, structural and psychological variables on four behaviourally distinct types of conservation response involving energy-efficiency improvements or curtailment of the services energy provides.

Method: A mail survey of residential electricity consumers in Massachusetts was used to generate the data (N = 478).

Variables: Four separate classes of behavioural response were identified and scaled: capital investment in energy efficiency, low-cost efficiency improvements, minor curtailments, and ambient temperature. Numerous social-psychological variables were also scaled. Other variables included demographics and dwelling characteristics.

Findings/implications: The causal model assumed that contextual variables (i.e., demographic, economic and structural) may affect behaviour indirectly through personal variables (i.e., attitudes, beliefs and norms), and that among personal variables, causality moves from the general through the specific to behaviour. Path analysis supported these assumptions, and also suggested that while behaviours that are relatively unconstrained for most households (such as temperature settings) are strongly influenced by norms, personal variables have much less influence on more constrained actions (such as major insulation activity). The effect of high and rising fuel prices was stronger in producing economic sacrifice than energy saving.

7299

Stern, Paul C., and Gerald T. Gardner
1982 The Place of Behavior Change in the Management of Environmental Problems.
Zeitschrift für Umweltpolitik, in press.

Abstract: There is a growing body of psychological research aimed at changing behaviours that contribute to environmental problems (i.e., production of wastes and overexploitation of energy and other resources). The authors summarize this research and note some of its contributions and limitations. They argue that for psychology to make its most significant contributions to environmental policy, it must first attempt a behaviourally oriented analysis of the technical systems that generate environmental problems. Such analyses are outlined for the problems of energy conservation, solid waste and air pollution. In all three cases, the same conclusions emerge: it is more effective to "prevent" environmental problems than to "cure" them, and the actions of individuals and households have less aggregate effect than those of industrial and governmental actors. These realizations suggest that there are behaviours with major potential that have been generally neglected by psychologists; these include individual purchase decisions, community action, and organizational and political behaviours. Finally, emphasis is given to the need to conduct research with an awareness of major long-term trends in world environmental and energy systems.

Stillman, Peter C. 7306
1978 Social Implications of Solar Energy.
Presented at the Conference Helios, Albany, N.Y., March 1978.

__Abstract__: In addition to the purely monetary and the ecological benefits, this paper discusses a number of functional and social implications associated with localized solar energy production. These implications mean increased independence for the country, a lessening of some antidemocratic aspects of governing and, for the individual, a range of benefits: increased economic independence, minimization (in the field of energy) of being managed and administered by undemocratic corporations and regulators, increased comprehension of the world and enhanced ability to act and choose therein.

7611

Taylor, Lester D.
1975 The Demand for Electricity: A Survey.
Bell Journal of Economics, 6, 74-110.

Abstract: This paper provides a detailed summary and evaluation of the existing econometric research on the demand for electricity; an analysis of the problems, both theoretical and empirical, that impede empirical research in the area; and some suggestions for future research. The main focus of the article is on the residential demand for electricity, but some attention is also given to the commercial and industrial sectors. The problems caused by multistep block pricing receive special attention, as does the issue of short-run versus long-run demand for electricity. The author, following a review of several studies, provides the following observations: the price elasticity of demand for electricity for all classes of consumers is much larger in the long run than in the short run -- this is also true for the income elasticity of demand; the long-run price elasticity of demand is indicated to be elastic; and there is little evidence of any cross elasticity of demand in the short run. The author concludes that the main shortcoming of the econometric literature on the residential demand for electricity is the failure to deal adequately with decreasing block pricing. He adds that an important area for future research involves the difference between peak and nonpeak demand for electricity.

The Eagleton Poll 7612

1982 HESP: An Evaluation of the Home Energy Savings Program. Prepared for the New Jersey Department of Energy, Rutgers University: Eagleton Institute of Politics.

Objective: To evaluate the Home Energy Savings Program (HESP) sponsored by the New Jersey Department of Energy and the state's utility companies.

Method: Interviews were conducted with a sample of 811 individuals in households which had HESP energy audits conducted in 1981 and a matched sample of 405 which had not had audits.

Variables: Major variables included various demographic, attitudinal and self-reported behavioural measures.

Findings/implications: There were significant differences between the audited and nonaudited groups across a variety of conservation behaviours. Audited households were more likely to have added insulation, caulking, weather stripping and storm windows and to have lowered the temperature setting on their hot water heater, among other behaviours. Audited households reported spending 50% more than their counterparts on conservation in 1981. The program was viewed favourably by those who participated, and compliance with the generally inexpensive recommendations was high. The authors estimate that half of the actions that people took to conserve energy would not have been taken if they had not had the energy audit.

7620

Tienda, Marta, and Osei-Mensah Aborampah
1981 Energy-Related Adaptations in Low-Income Nonmetropolitan Wisconsin Counties.
Journal of Consumer Research, 8, December, 265-270.

Objective: To illustrate how physical/structural and socioeconomic characteristics of households influence familial responses to changes in the cost of energy.

Method A telephone survey was conducted among household heads residing in four northeastern Wisconsin counties. Analysis was based on 273 respondents selected by a random digit dial selection method.

Variables: Independent: physical/structural characteristics of the household, including type of dwelling; ownership status and number of major appliances; demographic and socioeconomic characteristics.

Dependent: lifestyle and behaviour changes, energy conservation behaviour.

Findings/implications: The type of dwelling, number of major appliances and total family income were found to be equally important determinants of families' propensity to use alternative fuels in response to tightening energy supplies. The authors conclude that physical/structural characteristics of familial microenvironments are more important than socioeconomic and family factors in determining consumption levels. It was found that income plays an indirect role through other more salient variables. Low-income families were found to be less able to mitigate the impact of the energy crunch. Continued increases in the cost of energy can potentially reduce the real incomes of low-income groups at a relatively higher rate than those of higher-income groups.

Tishler, Asher 7625

1982 The Demand for Cars and the Price of Gasoline: The User Cost Approach.
Review of Economics and Statistics, 54, 2, 184-190.

Abstract: The purpose of this paper is to investigate the effect of the price of gasoline on the demand for cars. The theory of the user cost of capital is used to estimate the demand for new and used cars. The results demonstrate that the price of gasoline cannot be omitted from the demand function. Further, the importance of the price of gasoline increases with engine size. Income elasticities are higher for new cars than for old cars, and increase with engine size. Since further increases in gasoline prices in the future seem inevitable, a further reduction in the average size of cars, and perhaps even a decline in the number of cars in the economy, is implied.

7630

Tong, D.A., and I.D. Griffiths
1982 The Subjective Economics of Energy Conserving Goods: A Heuristic Investigation.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

__Abstract__: This paper is concerned with the relationship between preference for consumer goods and the perceived value of those goods. Individuals were asked to make trade-offs between energy-conserving goods and other consumer goods to provide a measure of the "value" of energy conservation.

In accordance with the British government's preferred goal of encouraging conservation through individual budgeting, the preferences existing within households were investigated. The inability of conventional economic and psychological approaches to produce this type of information is discussed and the philosophy for a new methodology is developed.

A study is carried out using a research tactic contingent with this philosophy. The results of the study show that consumers drawn from a sample of middle-income earners placed a higher subjective value on goods that conserve energy than on other goods of equivalent real price. The policy implications of this finding are discussed.

U.S. Department of Energy 8011
1981 Residential Energy Consumption Survey: 1979-1980 Consumption and Expenditures, Part I: National Data.
Washington, D.C.: U.S. Government Printing Office (DOE/EIA-0262/1).

__Abstract__: This report presents the results of the second residential energy consumption survey. The results of the 1979 Household Screener Survey cover the year April 1979 through March 1980, and can be compared with the National Interim Energy Consumption Survey (NIECS) covering the preceding 12 months. For the year ending March 1980, energy consumption per household dropped significantly from the preceding 12-month period. Over the same 12-month period, however, the total number of residential households increased. This increase tended to offset the energy savings realized by individual households to the extent that there was no statistically significant decline in total residential consumption nor in the consumption of any fuel except fuel oil. Prices for all forms of energy rose rapidly over the year, significantly outstripping the general rate of inflation for all fuels except electricity. Fuel oil prices rose nearly five times the rate of inflation, forcing expenditures up significantly for those households that continued to use fuel oil as their main source of heat. Many households, however, switched from fuel oil during the year, primarily to wood or natural gas. The net effect was that total nationwide expenditures for fuel oil showed no statistically significant increase despite the increase for individual households.

8012

U.S. Department of Energy
1981 Residential Energy Consumption Survey: 1978-1980 Consumption and Expenditures, Part II: Regional Data. Washington, D.C.: U.S. Government Printing Office (DOE/EIA-0262/2).

Abstract: This report is a corollary to the report Residential Energy Consumption Survey: 1979-1980 Consumption and Expenditures, Part I: National Data (DOE/EIA-0262/1). It presents data on household energy consumption and expenditures by region for the calendar year April 1979 through March 1980. These data represent the results of the 1979 Household Screener Survey covering the same time period and can be compared with the National Interim Energy Consumption Survey (NIECS) covering the preceding 12 months. Tables are provided which present regional data on total consumption and expenditures, consumption and expenditures by fuel type, and average residential energy prices for each year. Relative standard error tables are provided which apply to the NIECS data as well as to the Screener survey data.

U.S. Department of Energy 8021
1979 Social Science Contributions to DOE Conservation Programs in Buildings and Transportation: A Preliminary Study. Prepared by the Institution for Social and Policy Studies, Yale University.

Abstract: This study examines the present and potential social science components of work in the Transportation Energy Conservation (TEC) and Buildings and Community Systems (BCS) Divisions of the Office of Conservation and Solar Applications. It describes five types of contributions social scientists can make to the programs within TEC and BCS: (1) identifying and implementing direct social strategies for conservation; (2) enhancing market penetration of new conservation technologies; (3) predicting and analyzing barriers to implementation of programs; (4) predicting and analyzing social impacts of conservation programs; and (5) field evaluation of program effectiveness.

The ways in which each type of contribution is being used in the two divisions is discussed, and suggestions and recommendations are made for improving the efficiency with which each type of contribution is procured and integrated into program planning. Subprograms and project levels within BCS and TEC are also examined for social science components, and suggestions are offered for additional social science contributions to each subprogram.

8030

U.S. Department of Transportation
1981 Federal, State and Local Responses to 1979 Fuel Shortages. Prepared by Peat, Marwick, Mitchell & Co., Washington, D.C.

Abstract: An examination of federal, state and local responses to the 1979 fuel shortages uncovers many lessons which can be applied to present and future contingency planning efforts to enhance their effectiveness. As part of a study performed for the Office of the Secretary, U.S. Department of Transportation, case studies were made of emergency transportation energy conservation actions implemented, or attempted, in Los Angeles, Dallas, Fort Worth, Minneapolis-St. Paul, Seattle, Rhode Island and New York State. Information on responses to the fuel shortages for each case study area was obtained through on-site meetings with representatives of organizations having a strong interest in emergency transportation actions such as transit operators, metropolitan planning organizations, service station dealers, state highway and energy departments, ride-sharing agencies and others. Types of emergency transportation actions most commonly implemented or attempted in the case study areas were: expanded public information and marketing distribution systems; emergency expansion of ride-sharing; rehabilitation and placing in service of standby reserve or "mothball" fleet buses; implementation of odd-even and/or minimum-maximum fuel purchase restrictions; and monitoring of transit ridership and shifting buses to the most heavily used routes. These case studies discuss and partially assess the major transportation energy contingency actions implemented, key implementation problems encountered, and actions planned but not implemented. Preliminary conclusions, recommendations and implications for developing future transportation energy contingency plans are presented in a separate volume.

U.S. Department of Transportation 8035
1979 Energy Conservation in Transportation.
Cambridge, Mass.: U.S. Department of Transportation.

Abstract: This document is intended to acquaint the nontechnical reader with some of the terminology, policy issues, problems and solutions that have been proposed to reduce the inefficient use of energy and promote conservation in transportation. The first part of the report deals with motor vehicles. The impact of the energy crisis on daily household travel and public attitudes toward the energy crisis are examined. The implications of the 55-mile-per-hour speed limit are investigated, with major emphasis on fuel savings and safety considerations. Various proposals to encourage carpooling are described and evaluated using mathematical simulations of travel behaviour. The rationale underlying the fuel economy standards imposed on automobiles manufactured in 1981-84, as established by the Department of Transportation, is also described.

The second part of this report focuses on mass transit. The relationship between mass transit and energy consumption under alternative economic conditions is explored. Policies to encourage a shift from private automobiles to mass transit are proposed and evaluated. Two techniques to provide increased transit capacity in order to meet the anticipated growing demand for public transportation are also examined.

The third part of the report examines two other major modes of transportation, rail and air. In discussing rail freight transportation, specific recommendations are made for improvements in the daily operation of freight systems in order to save energy. The intercity passenger train is discussed in terms of both energy consumption and conservation. Strategies for airline fuel conservation are developed and analyzed by comparing the anticipated results to baseline estimates of energy use if conservation actions were not implemented.

The final section of this report presents the most currently available analysis of energy demand and conservation for each of these modes of transportation, as well as for waterways and pipelines.

8040

Uslaner, Eric M.
1982 Energy Policy and the Logic of Collective Inaction. In Manfred J. Holler, ed., Forming Coalitions. Vienna: Physica-Verlag, forthcoming.

Abstract: Energy will probably be the most difficult policy area for industrialized democracies to cope with in the 1980s. The United States in particular has been unable to come forward with anything resembling a comprehensive energy program that is also politically feasible. Examining the nature of the energy issue and the almost inexhaustible number of interests which are involved in related policy formation, this paper first notes that energy is quite different from other issues which are susceptible to successful coalition formation (logrolling) in democratic societies. Employing social choice theory, it is argued that conflicts centring on energy issues involve both cyclical majorities and Prisoners' Dilemmas, leading to a failure of collective action mechanisms. In Canada, in contrast to the United States, political cleavages are not quite so crosscutting, leading to a game of "chicken" rather than a Prisoners' Dilemma -- thus making it possible for decision makers to reach what has been referred to as a "prominent" solution to the policymaking game.

Uusitalo, Liisa 8045

N.D. Composition of Household Energy Consumption: Some Implications.

Discussion paper, Berlin: International Institute for Environment and Society.

Abstract: Direct energy consumption within the household sector is generally classified in one of two ways: residential energy use and energy use for private transport. Although there are several estimates concerning the composition of residential energy demand, few attempts have been made to estimate the composition of the total energy demand of an average household. Using secondary data sources, this paper aims at estimating total demand both from the point of view of a household's budget allocation and from the point of view of total energy demand. The composition of household energy expenditure at different income levels is explored and some implications for environmental policy are suggested.

8050

Uusitalo, Liisa, and Kari Djerf
1982 Determinants of Gasoline Consumption.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Objective: To determine the influence of different factors on gasoline consumption.

Method: Car stock and driving intensity are considered as intervening factors in a recursive model explaining total gasoline consumption. The estimates are based on a logarithmic model. The data consist of time series from the years 1970-79 of several European countries and the United States. Income elasticities were estimated for car stock and total gasoline consumption and price elasticities for driving intensity and total gasoline consumption.

Findings/implications: A test of the model's performance indicated that it had significant predictive power. Performance improved with a dynamic model specification. This dynamic model was then used to explore, through simulation, the effect of different pricing policies. Long-term forecasts were made under alternative assumptions about income growth.

The results show that only regular cumulative increases in real gasoline prices are effective in reducing driving intensity. The effect of price on total gasoline consumption remains limited, however, since at moderate income growth rates the growth of the car stock overcomes the price effect. Energy conservation policies should, by implication, pay more attention to factors which influence the car stock.

Valk, Peter J. 8404

1981 Commuter Demand for Ridesharing Services.
Transportation Research Record, 823, 17-21.

__Abstract__: Ride-sharing has recently become one of the most discussed topics in the fields of transportation system management and energy conservation. It is increasingly being looked on by both public and private sectors as a short-term answer to a variety of economic and environmental ills. Ride-sharing behaviour is manifested in two distinct ways: regular ride-sharing refers to the adoption of shared commuting on an ongoing basis; emergency ride-sharing is characterized by swift but short-term shifts from driving alone to pooling for the home-to-work trip. This paper characterizes both types of behaviour and addresses the implications for providing assistance to commuters in both settings.

8406

Van Houten, Ron, Paul A. Nau, and Michael Merrigan
1981 Reducing Elevator Energy Use: A Comparison of Posted Feedback and Reduced Elevator Convenience.
Journal of Applied Behavior Analysis, 14, 4, 377-387.

Objective: To examine the effects of two different procedures for reducing elevator energy use.

Method: The first experiment was conducted on users of three elevators in two buildings on the campus of a small Canadian university. A multiple baseline design was employed. One treatment involved posting feedback on electricity consumed by the elevator in the past week. The second treatment added exhortations in poster form to the first treatment. Next all signs were removed; then the operation of the elevator doors was slowed.

The second experiment, conducted in the academic year following experiment number one, utilized a similar methodology with a different order of presentation of treatments from the first experiment. Additionally, the number of passengers per trip was monitored.

Variables: Experiment one
Independent: treatments.
Dependent: electricity consumption.

Experiment two
Independent: treatments.
Dependent: electricity consumption, number of trips and passengers.

Findings/implications: Experiment one. Making elevator use less convenient reduced elevator use, whereas providing differential feedback on electricity consumption did not. The use of prompts did not reduce elevator use. The authors note that the provision of more immediate and individualized feedback could prove more effective than the weekly feedback utilized in this study.

Experiment two. The results of experiment one were confirmed. An increased delay between the opening and closing of the elevator doors resulted in significantly reduced energy consumption. Experiment two permitted the conclusion that energy was saved as a result of a change in behaviour and not merely through mechanical means.

8407

van Raaij, W. Fred, and Theo M.M. Verhallen
1981 A Behavioral Model for Residential Energy Use.
Presented at the 6th Annual Colloquium of Economic Psychology, Paris, August 25-28, 1981.

Abstract: This paper presents a model for household energy use that relates personal, environmental and behavioural factors to energy consumption. The following determinants of energy use are identified and discussed: sociodemographic factors; energy prices; energy-related behaviour; cost-benefit trade-offs, effectiveness and responsibility; social reference; feedback information; and dwelling characteristics. In view of the model, several strategies for energy conservation are discussed and suggestions are made for further research.

8411

Verhallen, Theo M.M., and W. Fred van Raaij
1981 Household Behavior and the Use of Natural Gas for Home Heating.
Journal of Consumer Research, 8, December, 253-257.

Objective: To investigate household behaviour and its impact on the use of natural gas for home heating.

Method: The energy use of 145 households in Vlaardingen, Holy-North, The Netherlands, was monitored from November 1976 through November 1977. During the first wave of the panel study one respondent per household (usually the wife) responded to eight statements on energy and price consciousness, home temperature and ecological concerns.

Variables: Independent: sociodemographics, house characteristics, household behaviour, attitudes.

Dependent: energy use, household behaviour.

Findings/implications: Attitudes and household behaviour, in combination with home characteristics, special circumstances and sociodemographics, explained 58% of the energy-use variance between households. Household behaviour alone explains 26%, home characteristics 24% and special circumstances 11%. Attitudes are poor predictors of household behaviour in this study. It was found that insulation served to decrease energy use by promoting lower thermostat settings but at the same time required more frequent airing out of rooms, thereby wasting energy. However, the net effect was still found to be positive and, therefore, worthwhile.

Walker, Bruce J. 8811
1978 Factors Influencing Solar Energy Commercialization. In Richard F. Hill, ed., Energy Technology V: Challenges to Technology. Washington, D.C.: Government Institutes, Inc., 473-479.

Objectives: (1) To assess the relative demand potential for selected solar energy products; (2) to isolate factors influencing current and future demand for solar energy products; and (3) to determine recommended business and government actions to accelerate commercialization.

Method: The analysis is based on survey data collected by the Arizona Solar Energy Research Commission during 1977. The study employed a two-phase version of the Delphi Method in which subjects were asked to complete two successive mail surveys. Of the initial sample of 660 individuals, 32.7% completed the Phase I questionnaire. Only these respondents were mailed a Phase II questionnaire. A response rate of 68.1% was obtained for the second survey.

Variables: Independent: ownership of solar energy products and/or employment that directly or indirectly relates to the solar energy industry; controlled feedback of subjects' responses to the Phase I survey in the Phase II survey.

Dependent: beliefs about current and future demand for solar energy products; beliefs about factors which inhibit as well as stimulate this demand; and recommended business and government actions to accelerate commercialization.

Findings/implications: For the period 1977-87, Delphi respondents projected a growing demand for solar energy products in Arizona. Largely uncontrollable factors emanating from the industry's environment, such as the high cost of energy, were perceived to stimulate this demand. The pace of commercialization, however, was viewed as basically controllable and determined by the nature, timing and quantity of planned accelerative actions. In particular, public education, lowering of prices, and research and development were recommended as appropriate actions for firms within the solar energy field. A substantial governmental role was anticipated and seemingly recommended, particularly financial assistance in the form of research and development funding and tax incentives. Since the actions recommended to business overlap with those recommended to government, the authors conclude that a high degree of coordination is essential to the acceleration of solar energy commercialization.

8812

Walker, Bruce J., and Kenneth A. Coney
1981 Consumer Adoption of an Energy Conservation Product. In Kenneth Burhardt et al., eds., The Changing Marketing Environment: New Theories and Applications. Chicago: American Marketing Association, 245-248.

Objectives: To examine the diffusion/adoption process associated with a new energy conservation product, the residential energy audit. (Differences between adopters and nonadopters of the residential energy audit, as well as the adopters categorized by time of adoption, were examined in order to identify potential influences on energy conservation policies).

Method: Telephone interviews were conducted with two subsamples. The first consisted of a systematic sample of adopters of the residential energy audit during the first 34 months it was offered. The second subsample consisted of nonadopters selected by a systematic procedure from telephone subscribers in Metropolitan Phoenix. The total sample consisted of 120 adopters and 133 nonadopters.

Variables: Independent: demographics, attitudes toward energy conservation, related energy conservation behaviour, reasons for purchasing or not purchasing the innovation, and information activity with respect to the purchase.

Dependent: adoption or nonadoption of the residential energy audit.

Findings/implications: Significant demographic differences exist between adopters and nonadopters. Similar comparisons were made of the adopters categorized by time of adoption, but few significant differences were found. The findings have the following implications for utility and government conservation policymaking:

(1) since the data indicate that adopters were primarily motivated to purchase the audit for personal, economic reasons, marketers and public policy officials interested in increasing energy conservation efforts should concentrate on personal, economic themes;

(2) there appears to be a preference for institutional (public and private) activities that encourage rather than mandate conservation practices by consumers;

Walker, Bruce J., and Kenneth A. Coney (cont.)

(3) careful consideration should be given to the fees charged for residential audits, for a majority of respondents indicated the belief that few people would willingly pay for conservation products; and

(4) since no differences exist between early adopters and later adopters, targeting to early adopters does not seem feasible.

8819

Warren, Donald I.

1982 Citizen Action and Nuclear Policy: Patterns of Pro and Anti Nuclear Energy Advocacy in the United States.
Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: This paper provides empirical evidence of the continuing role that citizen grass roots mobilization plays in the direction of federal and state nuclear energy policy. Data derived from a June 1981 national Gallup survey place citizen voluntary action for and against the use of nuclear power for energy generation in the context of 16 social issues. Questions regarding financial contributions and membership in advocacy organizations were asked of the U.S. national sample of 1,535 persons 18 years of age or older.

By distinguishing between the two levels of "social movement" actions and atomistic "public opinion attitudes," it is possible to trace the growth and future directions which characterize a given social problem. The analysis of the Gallup survey focuses on two descriptive issues of public opinion mobilization: (1) the unique demographic profile of "nuclear activists" pro and con; and (2) the correlation between activism on nuclear policy and activism on a range of other issues such as environmental and wildlife protection. In addition, some speculations regarding the meaning of the above patterns are discussed. Through an examination of the network linkages of nuclear power activists to other issues in terms of reported past action and potential future participation, a conceptual framework for tracing social movement viability of pro- and antinuclear citizen-based action is developed.

Warriner, G. Keith 8821

1981 Electricity Consumption by the Elderly: Policy Implications.

Journal of Consumer Research, 8, December, 258-264.

Objective: To examine the impact of increasing electricity prices and potential scarcity of electricity on the elderly and to examine the policy implications.

Method: Data were collected in conjunction with a four-year panel study (spring 1976 to spring 1980) of time-of-use rates in Wisconsin. Appliance and demographic data were collected by mail. Homes with electric space heating (N = 55) were dropped from the sample, leaving 606 residences containing only adults whose average age was 65 years or older. Actual consumption data were collected.

Variables: Independent: income, age.

Dependent: monthly consumption in kilowatt hours, average monthly bill.

Findings/implications: Elderly residents used about one-third less electricity on average than the nonelderly. The elderly paid proportionally more of their annual incomes for electricity than nonelderly households (5% vs. 3%). The elderly used 81% of their electricity for essential needs such as lighting, refrigeration, water heating and cooking, whereas the nonelderly used only 54% for these purposes. Because the elderly had fewer people per household they used more electricity per capita. The elderly have substantially lower incomes than the nonelderly. The author concludes that the elderly possess a unique set of circumstances mitigated by choice and life span characteristics which are responsible for the amounts of electricity they purchase, independent of the fact that they are economically worse off than other groups.

8826

Washington Water Power Company
1982 Wood Heating: Current and Future Use.
Consumer Services, Research and Forecasting Section, Washington Water Power Company.

Objectives: (1) To determine the factors which have led to the growth in residential wood heating and their importance in the future; and (2) to determine whether the number of customers using wood will increase, decrease or remain the same, and what factors will control these changes.

Method: Telephone interviews were conducted with 200 wood users and 200 nonusers of wood randomly selected from the service territory of Washington Water Power Company. Wood heat users were defined as those customers who reported that they derived over 50% of their space heating requirements from burning wood; nonusers were defined as those who derived less than 25% of their space heating requirements from burning wood.

Variables: Independent: demographic variables, characteristics of residence.

Dependent: reasons for using or not using wood, perceptions of supply and cost, intentions to use or not use wood under various scenarios.

Findings/implications: The perceived economic benefit is the primary motivation behind the adoption and the use of wood heating. Constraints on future use and adoption also appear to be economic (price of other fuels and "free" wood supply), although lifestyle constraints may also play a role.

While short-term factors (i.e., electricity prices) seem to favour an increase in wood use, the long-term signals are mixed. Electricity prices are expected to level somewhat in the next ten years, and competition for wood on public land may make wood a less attractive heating alternative. A number of other factors are cited which are expected to work against the long-range increase in wood heating. On the other hand, over the next ten years the efficiency of wood heaters will also improve. The authors predict that long-term use will probably decrease to levels slightly below those of today.

On an aggregate basis, economics alone do not seem to account for current wood use. The authors conclude that the adoption and use of wood heating apppears to involve a fairly complex set of decisions, actions and behaviours.

Washington Water Power Company (cont.)

The following factors may well interact with economic factors in explaining the adoption of wood heat: the pattern of costs and expenses for wood heating is different from that for conventional systems; wood heating may give the user the feeling of having greater control over the world; and the money and effort spent on wood heating results in a more visible product.

8836

Weeks, Robert G.
1978 Limits of Conservation: Implications for Energy Policy. Proceedings of the Association for Consumer Research, 322-323.

__Abstract__: This brief article is the transcript of a speech prepared by a representative of the Mobil Oil Corporation. The author states that although energy conservation is important to the national energy effort it does not constitute a reasonable alternative to developing the energy resources of the United States. While acknowledging that Americans have a very serious energy problem, he believes that conservation should be limited to restricting waste, and that there is no need to conserve beyond this level. It is pointed out that Americans have responded to higher energy prices in a selective fashion: conserving energy around the house and not conserving very much in terms of gasoline. Drivers have become more price conscious but have not reduced driving. The author concludes that Americans are not willing to alter their lifestyles, nor should they be expected to. He adds that even if Americans were able to reduce consumption to an annual growth of 2% per year, the United States would still be in trouble by 1985 with no increase in supply. In sum, the author states that conservation is not a viable alternative to increased productivity.

Winett, Richard A., and Peter Ester 8851
1982 Behavioral Science and Energy Conservation: Conceptualizations, Strategies, Outcomes, Energy Policy Applications. Presented at the International Conference on Consumer Behavior and Energy Policy, Noordwijkerhout, The Netherlands, September 26-29, 1982.

Abstract: While economic, physical design and legal/regulatory disciplines have been the dominant approaches in energy conservation policies, each perspective has limitations with regard to effectively being able to modify the energy-related behaviour of consumers. A behavioural science approach which integrates knowledge bases from a number of disciplines and levels of analysis has had relatively little input into energy policy, even though conceptually and technically the approach is well developed, and has recently demonstrated its applicability to energy policy through many field experiments. These studies, which have used combinations of antecedent and consequence strategies, are critically reviewed in terms of energy savings attributable to these strategies and the potential for large-scale applicability. Based on this review, a sophisticated, media-based approach, developed from a detailed marketing plan, is described as the foundation of a basic program. However, such a program would be experimental in nature and contain subparts to allow for a careful evaluation of other strategies (i.e., diffusion, feedback). Thus the behavioural sciences, while by no means offering a panacea, can make important contributions to energy policy when working in concert with other disciplines.

8852

Winett, Richard A., Joseph W. Hatcher, T. Richard Fort, Ingrid N. Leckliter, Susan Q. Love, Anne W. Riley, and James F. Fishback

1982 The Effects of Videotape Modeling and Daily Feedback on Residential Electricity Conservation, Home Temperature and Humidity, Perceived Comfort, and Clothing Worn: Winter and Summer.
Paper under review.

Objectives: To ascertain how energy conservation strategies focusing on thermostat change and setbacks and other low-cost/no-cost approaches would affect overall electricity use and electricity used for heating and cooling; the home thermal environment; the perceived comfort of participants, and clothing that was worn. In addition, studies assessed the effectiveness of videotape modelling programs that demonstrated these conservation strategies when used alone or combined with daily feedback on electricity use. The studies were also seen as a field-based alternative to laboratory studies, which have been the primary basis for determining comfort standards in buildings.

Method: Two studies, a winter study (N = 83) and a summer study (N = 54), were conducted in all-electric townhouses and apartments randomly assigned to experimental groups.

Variables: Independent: demographics, videotape modelling, feedback, thermostat changes.

Dependent: perceived comfort, household electricity consumption, clothing worn.

Findings/implications: In the winter, the results indicated that videotape modelling and/or feedback were effective relative to baseline and a control group in reducing overall electricity use by about 15%, and electricity used for heating by about 25%. Hygrothermographs, which accurately and continuously recorded temperature and humidity in the homes, indicated that participants were able to live with no loss in comfort and no change in attire at a mean temperature of about 62° F when home and about 59° F when asleep. The results were inconsistent with prior laboratory studies indicating comfort at 75° F with the insulation value of the clothing worn by participants in this study. In the summer, a combination of strategies designed to keep a home cool with minimal or no air conditioning, in conjunction with videotape modelling and/or daily feedback, resulted in overall electricity reductions of about 15%, with reductions in electricity for cooling of about 35%. Feedback, and feedback and modelling, were more effective than modelling alone. Despite

Winett, Richard A., Joseph W. Hatcher, T. Richard Fort, Ingrid N. Leckliter, Susan Q. Love, Anne W. Riley, and James F. Fishback (cont.)

these electricity savings, hygrothermograph recordings indicated minimal temperature change in the home, and there was no change in perceived comfort or clothing worn. The results were discussed in terms of discrepancies with laboratory studies, optimal combinations of video-media and personal contact to promote behaviour change, and energy policies which may be mislabelled as sacrificial and underestimate the effectiveness of conservation strategies such as those investigated in these studies.

8853

Winett, Richard A., and John H. Kagel
1982 Impact of Alternative Information Flows on Demand for Resources.
Working paper, Virginia Polytechnic Institute and State University, Blacksburg, Va.

Abstract: This paper reviews recent psychologically based field experiments on resource conservation, particularly those studies conducted in the residential sector. It is shown that certain psychological procedures which constitute an information technology can result at times in the same or greater reductions in energy use than large price increases. It is also shown that the results of these studies could not be explained on the basis of volunteer or expectancy effects, and that the effectiveness of specific procedures has been consistently replicated in diverse studies. Marked reductions in energy use in these studies are apparently achieved, in part, through input substitution (i.e., switching to more energy-efficient techniques) and appear associated with constant perceived comfort levels. At a minimum, this paper suggests much greater returns if current governmental efforts adopt aspects of an effective information technology.

Winett, Richard A., and Susan Q. Love 8854

1982 The Effectiveness of an Energy Specialist and Extension Agents in Promoting Summer Energy Conservation by Home Visits.

Paper under review.

Objectives: (1) To develop effective antecedent strategies that can be used by energy or extension services. (The effectiveness of extension agents and a trained energy specialist in delivering the interventions by home visits was compared.) (2) To replicate the feasibility of substituting window fans and other strategies for air conditioning while maintaining comfort in typical residential low-rise apartment buildings. (3) To ascertain if these strategies could work with a low-income population.

Method: Participants were lower-income consumers (N = 52 households) living in all-electric apartments which were dispersed around the city of Roanoke, Virginia. They were assigned to three different groups, two experimental and one control, following a stratified random assignment procedure. Two home visits were conducted, taking a mean of ten minutes each.

Variables: Independent: nature of treatment.

Dependent: electricity consumption and verifications of following project procedures.

Findings/implications: Relative to prior baseline use and control groups, the technician and extension groups reduced electricity use by about 21%; on warm days use was reduced by about 24%, and on cooler days by about 9%. The technician and extension groups performed about the same, although the technician group showed a somewhat more consistent and enduring response. No loss in comfort or convenience followed the use of fans or other strategies. The results of the study are discussed in relation to the "house-doctor" model, the need to develop other effective, active antecedent strategies, and the large savings accruable from simple conservation steps.

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Winett, Richard A., Susie Q. Love, Brian Stahl, Donna E. Chinn, and Ingrid N. Leckliter

1982 A Field-Based Approach to the Development of Comfort Standards, Energy Conservation Strategies, and Media-Based Motivational Strategies: A Replication and Extension of Winter Findings.
Unpublished manuscript, Virginia Polytechnic Institute and State University, Blacksburg, Va.

Objectives: To replicate and extend prior work on a field-based approach to the development of comfort standards, low-cost/no-cost conservation strategies, and media procedures to increase consumer knowledge and motivate responsiveness.

Method: The study, conducted during the winter, involved 105 houses and about 150 adults residing in all-electric apartments. Following a baseline phase, participants saw two brief videotape programs that demonstrated conservation strategies within a story line. Some participants saw the programs at home, others in groups. Some also received social support while other participants did not receive support. A comparison group did not view the programs.

Variables: Independent: treatment.

Dependent: kilowatt hour consumption, continuous measurement of temperature and humidity inside the homes with hygrothermographs, weekly measures of comfort and clothing worn (CLO), and a pre-post measure on information about comfort and conservation strategies.

Findings/implications: By adopting the simple conservation strategies, where low-cost ones substituted for and offset high-cost ones, consumers were able to reduce overall electricity use by about 13% and electricity used for heating by about 25% — results which replicate prior research. The offsetting strategies kept the temperatures of the apartments at about 19.6° C (67.4° F) with only 0.65 CLO. This situation was perceived as comfortable by participants. Though temperature was higher than in the prior study (17.6° C, 62.6° F), CLO-value was somewhat lower, with CLO-value and temperature from the present study being below comfort standards based on laboratory research. Consumers were also found to have limited knowledge of comfort and conservation strategies prior to the programs, but showed large information gains after the programs. The results are discussed in terms of a

Winett, Richard A., Susie Q. Love, Brian Stahl, Donna E. Chinn, and Ingrid N. Leckliter (cont.)

field-based approach to studying comfort and conservation strategies, the effectiveness of simple strategies, and the potential of the TV media in promoting informational and behavioural changes.

8866

Winkler, Robin C., and Richard A. Winnett
1982 Behavioral Interventions in Resource Conservation: A Systems Approach Based on Behavioral Economics.
American Psychologist, 37, 4, 421-435.

Abstract: The authors argue that traditional applied behaviour analysis studies tend to be too narrow and do not appreciate that the target behaviour being studied is in fact part of a system of behaviours and consequences, and must be studied as such. The advantages of viewing conservation behaviours from psychological (social learning) and economic perspectives are delineated. The authors illustrate the value of these approaches by analyzing various rebate studies wherein rebates were used to encourage water and residential energy conservation. In contrast to traditional econometric studies, rebates were used to estimate price elasticity experimentally. The authors also conducted a meta-analysis on behavioural energy studies conducted from 1973 to 1980 which shows that the effectiveness of rebates and feedback is explained, at least in part, by economic factors. The value of this integrative approach is also demonstrated by analysis of field-based studies designed to modify perceptions of comfort and residential energy conservation. Finally, the authors develop a rebate system congruent with planning policies to reduce domestic water consumption. The emphasis of the article is on the importance of combining economic and psychological analyses for effective resource management.

Yantis, Betty, and John E. Nixon 9401
1982 Energy Conservation -- An Appliance Use Survey. The Proceedings of the American Institute for Decision Sciences, Southwest Region, March 1982, 7-9.

Objectives: (1) To determine the type, number and use patterns of appliances and heating/cooling units used by local residents; (2) to identify utility customers who would be willing to participate in an experimental energy measurement program; and (3) to identify demographic and economic characteristics of electric energy consumers.

Method: Questionnaires were mailed to a random sample of households served by a local utility interested in implementing a conservation/load management program. The final sample consisted of 1,754 customers (a 24% response rate).

Variables: Demographics, dwelling characteristics, the number and types of appliances owned, appliance usage measures, willingness to participate in a metering program.

Findings/implications: The number and type of appliances vary with type of housing and income groups. Single-family dwellings tend to contain more of the basic appliances (washers, dryers, dishwashers, etc.). Higher-income groups own more appliances. The majority of respondents use their washers and dryers on weekends only. This could be significant in that air conditioning use tends to be heaviest on weekends, which adds to the peak-load problem. Although most appliances are used during the day, a tendency toward "night only" use of cooking appliances and television is reported. Over half of all respondents practice conservation through thermostat adjustments for heating and cooling, although less than one-fourth change hot water heater settings. Over half of the sample did not respond to insulation questions. This may reflect the fact that people do not know, especially in apartments and condominiums, how much insulation they have. A 27% decline since 1979 in willingness to participate in an electrical appliance metering program needs further exploration. The authors note that because of the unique insular location of the study community and the diverse socioeconomic characteristics of the area, findings may be applicable on a regional/national basis.

9420

Yavas, Ugur, and Glen Riecken
1981 Stimulating Energy Conservation: The Use of the Opinion Leadership Process.
Energy Policy, 9, 3, 226-231.

Objective: To investigate the feasibility of an opinion leader approach in disseminating energy-related information among the general public.

Method: Telephone interviews were conducted with a sample of household representatives residing in a midwestern U.S. city. Over a seven-day period, 480 residents were contacted, with a total of 380 completing interviews (a 79% response rate).

Variables: Major variables include demographics, scores on an opinion leadership scale, attitudes toward and knowledge about energy-related matters.

Findings/implications: The limited success of the government, oil companies and public utilities in terms of generating energy awareness among the public has been attributed to their low credibility. This article proposes opinion leadership as a means of dealing with the low credibility problem and finds empirical support for the view that opinion leadership can facilitate the dissemination of energy awareness among the general public. Opinion leaders are attentive to relevant information sources concerning energy, are knowledgeable about energy-related matters and are convinced about the seriousness of the crisis. Furthermore, they are demographically similar to opinion recipients. The authors provide some specific guidelines which can be used to put opinion leadership into actual use.

Zerega, Anne Marie 9580

1981 Transportation Energy Conservation Policy: Implications for Social Science Research.
Journal of Social Issues, 37, 2, 31-50.

Abstract: This paper examines the role that social science research plays in federal transportation energy conservation policy; assesses the current forms and degrees of consideration of social issues in transportation energy conservation policy; and identifies additional contributions that the social sciences could make toward achieving energy conservation goals. The analysis begins with transportation energy-consumption figures. It then discusses conventional techniques used to develop transportation energy conservation policy, provides an assessment of the implications of these conventional techniques and, finally, examines certain case studies to identify roles that the social sciences could play in transportation energy conservation policy. The author concludes that: (1) energy conservation policy does not consider psychological factors underlying mechanical economic realities except as evidenced by market responses to rising energy prices and other economic measures; (2) transportation and energy philosophy, analytical tools and interpretive techniques do not allow for consideration of social and behavioural issues; (3) energy problems are causing a shift in the nature of the U.S. transportation system; and (4) there is a serious need for government to identify, analyze and understand the psychological and sociological forces affected when national transportation energy conservation policy is charted.